

## PROVISIONAL ANSWER KEY

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Exam:	Assistant Professor in Natural Science - (Paper - I)
Date of Test	16-06-2026
Department	Collegiate Education (Govt.Training Colleges)

Question1:-When two competing theories are related to a certain phenomenon then the scientist will prefer the theory which explains

A:-no observations and no assumptions

B:-fewer assumptions and no observations

C:-fewer observations by making larger number of assumptions

D:-larger number of observations by making fewer assumptions

Correct Answer:- Option-D

Question2:-Which statement/s is/are true among the following about scientific literacy

- (i) It helps to better cope with societal problems
- (ii) It stands on knowledge of the basic facts of science
- (iii) It is the understanding of unique cases of a study
- (iv) It develops the believes through social and emotional bonding

A:-(i) and (ii)

B:-(ii) and (iii)

C:-(i), (ii) and (iii)

D:-only (ii)

Correct Answer:- Option-A

Question3:-Match the following for the verbs (items of column A and B are with dimensions and verbs respectively)

Column A	Column B
1 Understand	(i) Survey, figure, find examine, modify
2 Apply	(ii) Argue, defend, justify, rate, recommend

- 3 Analyze (iii) Demonstrate, diagnose, calculate, contrast, criticize  
4 Evaluate (iv) Report, review, describe translate, indicate

A:-1-ii, 2-i, 3-iv, 4-iii

B:-1-iii, 2-iv, 3-i, 4-ii

C:-1-iv, 2-iii, 3-i, 4-ii

D:-1-iv, 2-i, 3-ii, 4-iii

Correct Answer:- Option-C

Question4:-Which among the following is a correct order?

A:-Remembering, understanding, applying, analyzing, evaluating, creating

B:-Creating, remembering, understanding, applying, analyzing, evaluating

C:-Creating, understanding, remembering, applying, analyzing, evaluating

D:-Remembering, understanding, applying, creating, analyzing, evaluating

Correct Answer:- Option-A

Question5:-Match the items of column A with column B :

Column A	Column B
1 Technology integrated taxonomy	(i) Storage or display information
2 Passive role of learners	(ii) Compiling information into digital repository
3 Active exploration of materials and ideas	(iii) Aligns ICT with cognitive levels
4 Problem solving	(iv) Directing the search

A:-1-i, 2-ii, 3-iii, 4-iv

B:-1-ii, 2-iii, 3-iv, 4-i

C:-1-iii, 2-i, 3-iv, 4-ii

D:-1-iv, 2-iii, 3-i, 4-ii

Correct Answer:- Option-C

Question6:-There are two statement I and II. In each of these questions :

Statement I - Science provides the methods and necessary tools to explore and understand by world.

Statement II - Science is an organised system of knowledge and enables an understanding of the physical and biological environments

A:-Choose option (A), if both statements are true and statement II is the correct explanation of statement I

B:-Choose option (B), if both statements are true but statement II is not the correct explanation of statement I

C:-Choose option (C), if statement I is true, but statement II is false

D:-Choose option (D), if statement I is false, but statement II is true

Correct Answer:- Option-B

Question7:-There are two statement I and II. In each of these questions :

Statement I - Scientific attitude develops through the inquiry-based method

Statement II - Following an inquiry based method, student learns to reason, explore and draw connections between academic content and their own lives.

A:-Choose option (A), if both statements are true and statement II is the correct explanation of statement I

B:-Choose option (B), if both statements are true but statement II is not the correct explanation of statement I

C:-Choose option (C), if statement I is true, but statement II is false

D:-Choose option (D), if statement I is false, but statement II is true

Correct Answer:- Option-A

Question8:-There are two statement I and II. In each of these questions :

Statement I - Learning objectives are to be achieved by the teachers and permanent in nature

Statement II - Learning objectives can be changed or modified depending upon the needs of the learners

A:-Choose option (A), if both statements are true and statement II is the correct explanation of statement I

B:-Choose option (B), if both statements are true but statement II is not the correct explanation of statement I

C:-Choose option (C), if statement I is true, but statement II is false

D:-Choose option (D), if statement I is false, but statement II is true

Correct Answer:- Option-D

Question9:-Match the items of column A with column B

Column A

Column B

- |                               |   |
|-------------------------------|---|
| 1. Fink's taxonomy            | (i) to structure learning outcomes in modern educational settings |
| 2. Bloom's taxonomy           | (ii) integrates diverse dimensions of learning                    |
| 3. Revised Bloom's taxonomy   | (iii) classification of intellectual behavior levels              |
| 4. Peck and Witson's taxonomy | (iv) to align with the growing use of technology                  |

A:-1-ii, 2-iii, 3-iv, 4-i

B:-1-ii, 2-iii, 3-i, 4-iv

C:-1-i, 2-iii, 3-iv, 4-ii

D:-1-i, 2-ii, 3-iii, 4-iv

Correct Answer:- Option-B

Question10:-What major step/s is/are to be taken to develop an inclusive science classroom fulfilling the needs of every learner

- (i) highlighting the contribution of women and a gender-fare approach
- (ii) increasing the enrollment in science stream
- (iii) developing a support system for disadvantaged groups
- (iv) teaching should be digital for all the students

A:-(i) and (ii)

B:-(ii) and (iii)

C:-(i) and (iv)

D:-(i) and (iii)

Correct Answer:- Option-D

Question11:-What was one of the major objectives behind the fink taxonomy of significant learning?

A:-to restructure the Bloom's taxonomy

B:-to develop a science curriculum

C:-to go beyond the cognitive learning

D:-to establish the collaboration and co-ordination among the teachers

Correct Answer:- Option-C

Question12:-Learning objectives in science education should mainly focus on

A:-What is written in the textbook

B:-What the learners will do

C:-What the teachers will do

D:-What the science teacher will decide

Correct Answer:- Option-B

Question13:-Teaching 'seed germination' in the classroom can nurture the process skill by

A:-field trips

B:-experimentation

C:-instruction

D:-evaluation

Correct Answer:- Option-B

Question14:-Match the items of column A with column B

Column A                  Column B

- |                  |                                       |
|------------------|---------------------------------------|
| 1. understanding | a) develop something new              |
| 2. applying      | b) identify schemes or relationships  |
| 3. analyzing     | c) use information in a new situation |
| 4. creating      | d) grasp meaning of materials         |

A:-1-b, 2-c, 3-d, 4-a

B:-1-d, 2-c, 3-b, 4-a

C:-1-d, 2-a, 3-b, 4-c

D:-1-a, 2-b, 3-c, 4-d

Correct Answer:- Option-B

Question15:-Construction of 'electronic portfolio' and representing it in an 'electronic form' belongs to

A:-allow the storage or display information

B:-foster exploration of materials and ideas

C:-enable the application of understanding

D:-organize materials or ideas to foster analysis

Correct Answer:- Option-C

Question16:-According to the technology integrated taxonomy technology as a cognitive tool

- A:-provides the knowledge directly
- B:-physically supports to present the content
- C:-create knowledge in the form of a catalyst
- D:-gives the proper instruction in the classroom

Correct Answer:- Option-C

Question17:-Which of the following reflects integration in significant learning taxonomy

- A:-learning communities
- B:-practical thinking
- C:-multicultural education
- D:-intentional learner

Correct Answer:- Option-A

Question18:-Revised Bloom's taxonomy has two identified dimensions, they are

- A:-Knowledge and Integration
- B:-Content and Pedagogy
- C:-Technology and Content
- D:-Knowledge and Cognitive process

Correct Answer:- Option-D

Question19:-Which one of the following does not reflect the desirable shift in science education

- A:-formal classroom to digital classroom
- B:-role memory to understanding and application
- C:-fixed body of knowledge to the constructing knowledge for competencies
- D:-content to organised experiences

Correct Answer:- Option-A

Question20:-Which type of learning in science permits students to take ownership

A:-if they follow inquiry - based learning

B:-if they practice to learn to do better in exam

C:-if they share the scientific contents

D:-if they interact in the classroom

Correct Answer:- Option-A

Question21:-While teaching Science constructing explanations involves :

A:-Constructing explanations = Logical thinking + Evidence

B:-Constructing explanations = Logical thinking + Science ideas/theories

C:-Constructing explanations = Science ideas/theories + Evidence

D:-Constructing explanations=Logical thinking + Science ideas/theories + Evidence

Correct Answer:- Option-D

Question22:-Mind mapping Approach was popularized by

A:-John Dewey

B:-Tony Buzan

C:-John Wertheimer

D:-Gordon Allport

Correct Answer:- Option-B

Question23:-Approach where learning is focused on exploration of science through investigating meaningful questions and problems that children find engaging, sparking curiosity and wonderment about the world is

A:-Project based learning

B:-Inductive approach

C:-Mind reading

D:-Concept mapping

Correct Answer:- Option-A

**Question24:-**Which of the following is the last element of Constructivist Approach as given by Tolman & Hardy in 1995.

A:-Acquiring Knowledge

B:-Using Knowledge

C:-Reflecting on Knowledge

D:-Understanding Knowledge

**Correct Answer:- Option-C**

**Question25:-**The 'E' in 5E learning approach is arranged in the order of

A:-Engage, Explore, Explain, Elaborate and Evaluate

B:-Explore, Engage, Explain, Elaborate and Evaluate

C:-Explain, Explore, Engage, Elaborate and Evaluate

D:-Elaborate, Explain, Explore, Engage and Evaluate

**Correct Answer:- Option-A**

**Question26:-**Collaborative learning approach helps to develop the following in learner in an integrated manner

- (i) academic
- (ii) social skill
- (iii) emotional skill

A:-Only (ii & iii)

B:-Only (i & ii)

C:-Only (i& iii)

D:-All of the above (i, ii & iii)

**Correct Answer:- Option-B**

**Question27:-**It is considered to be an offshoot of the Ausubelian approach which was developed in its standard form by Novak in 1984.

A:-Geographical map

B:-Mind map

C:-Concept map

D:-Physical map

Correct Answer:- Option-C

Question28:-The four stages of Experiential learning as suggested by Kolb & Fry (1975) are

A:-Active experiences, Reflective observation, Abstract conceptualisation, Concrete experimentation

B:-Concrete experiences. Reflective observation, Abstract conceptualisation, Active experimentation

C:-Active experiences, Abstract observation, Reflective conceptualisation, Concrete experimentation

D:-Abstract experiences, Active observation, Reflective conceptualisation, Concrete Experimentation

Correct Answer:- Option-B

Question29:-This method is unnatural and is not psychological for small students who do not develop ability to appreciate abstract ideas in the absence of concrete examples.

A:-Inductive method

B:-Deductive method

C:-Discovery method

D:-Inquiry method

Correct Answer:- Option-B

Question30:-Panchpadi is a good guide to formulate the sequence that a teacher may adopt in planning for instruction of certain concepts and contexts. It include five steps in the process as

A:-Introduction, Conceptual understanding, Practice, Application, Expansion

B:-Conceptual understanding, Introduction, Practice, Application, Expansion

C:-Introduction, Conceptual understanding, Expansion, Practice, Application

D:-Conceptual understanding, Expansion, Introduction, Practice, Application,

Correct Answer:- Option-A

Question31:-In this method the child generates information on his own, which he can then check or evaluate against the sources, getting more new information in the process

A:-Inductive method

B:-Deductive method

C:-Discovery method

D:-Project method

**Correct Answer:- Option-C**

**Question32:-**“Teachers are expected to be reflective practitioners, competent to use multiple methods and techniques, to engage learners, keeping the socio-cultural context and experiences of the learners in mind”

A:-NCFSE 2023

B:-NCFFS 2022

C:-NCFTE 2009

D:-NCF 2005

**Correct Answer:- Option-D**

**Question33:-**Reflective approach in teacher preparation helps student teacher to identify one's weaknesses and strength with SWOT analysis. SWOT means

A:-Strengths, Work, Offers, Time

B:-Skills, Work, Openness, Time

C:-Smartness, Weaknesses, Offers, Threats

D:-Strengths. Weaknesses, Opportunities, Threats

**Correct Answer:- Option-D**

**Question34:-**Cooperative approach is based on which of the following principles given below

- i. The Principle of Distributed Leadership
- ii. The Principle of Heterogeneous Grouping
- iii. The Principle of Homogenous Grouping
- iv. The Principle of Positive Interdependence
- v. The Principle of Negative Interdependence
- vi. The Principle of Social skills Acquisition
- vii. The Principle of Personal Skills Acquisition
- viii. The Principle of Group Autonomy
- ix. The Principle of Subordination
- x. The Principle of Subjectivity

A:-Only (ii, v, vii, ix and x)

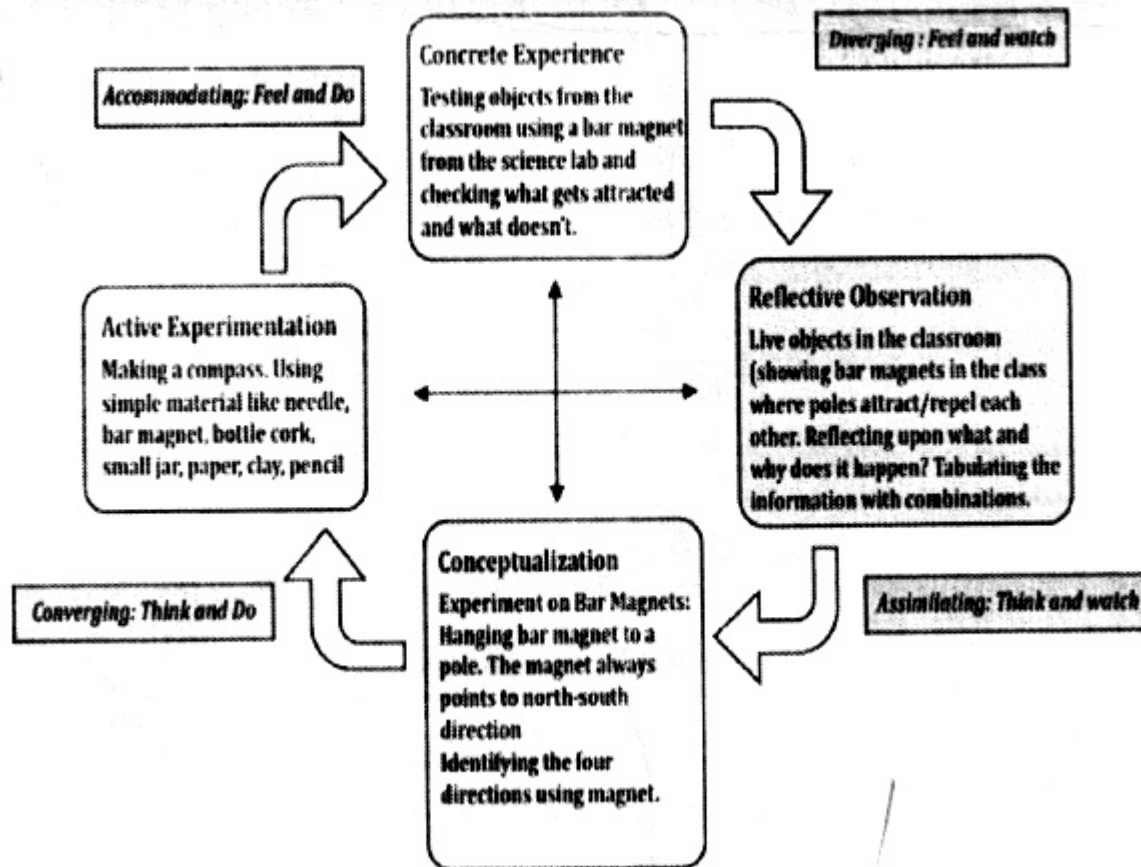
B:-Only (i, ii, iv, vi and viii)

C:-Only (i, iii, v, vii and ix)

D:-Only (iii, iv, v, vii and viii)

Correct Answer:- Option-B

Question35:-



The above picture on topic 'Fun with Magnet' is an exemplar depicting the stages of

A:-Cooperative Learning Approach

B:- Heuristic Approach

C:- Experiential Learning Approach

D:- Inquiry based Learning Approach

Correct Answer:- Option-C

Question36:-Which of the following classroom situations reflect the highest level of application of the Concept Attainment Model?

A:-Students underline the important terms in their textbooks

B:-Students are able to memorize the definition given by the teacher

C:-Students identify examples after the teacher explains the concept

D:-Students independently generate examples and non-examples of a newly learned concept

Correct Answer:- Option-D

Question37:- On which learning theory is the Advance Organizer Model based?

A:-Behaviourism

B:-Cognitivism

C:-Constructivism

D:-Humanism

Correct Answer:- Option-B

Question38:-A Biology teacher shows her students a plant growing in complete darkness and bending towards a small source of light. Students are encouraged to identify the possible causes, verify their assumptions and validate their conclusions with evidence. Which aspect of the Inquiry Training Model is most visible here?

A:-Reinforcement through repetitive practice exercises

B:-Passive reception of information

C:-Development of analytical and scientific reasoning skills through investigation and problem solving

D:-Memorization of textbook definitions before experimentation

Correct Answer:- Option-C

Question39:-A Science teacher introduces a chapter on 'Sustainable Cities' and presents a short documentary on urban waste management. She directs the students to follow the Group Investigation Model to explore solutions. Which of the following options represents the correct sequence of these activities according to the stages of the Group Investigation Model?

- I. Students present an interactive exhibition of their findings to the rest of the school.
- II. Students formulate a shared research question, assign roles, and decide to use community interviews and library a databases.
- III. Students read local news articles on urban waste, discuss their personal interests, and form a four-member team focussed on "Electronic Waste."
- IV. Students complete a self-reflection rubric on their teamwork skills, and the teacher grades their final project portfolios.
- V. Students conduct field interviews, compile data from online journals, and analyse the statistics together.
- VI. Students took over their collected data, isolated the most critical insights, and created a digital slideshow for their upcoming presentation.

A:-III, II, V, VI, I, IV

B:-II, III, V, VI, I, IV

C:-III, II, VI, V, I, IV

D:-II, III, VI, V, IV, I

Correct Answer:- Option-A

**Question40:-**A school implements an immersive language learning ITS (Intelligent Tutoring Systems). When a student speaks with a heavy regional accent, the voice recognition screen freezes, fails to process the audio, and displays a generic system timeout crash error. Which component broke down, and how should it be upgraded to handle this user input?

A:-The Pedagogical Model: It requires a new curriculum syllabus on advanced linguistics.

B:-The Expert Model: It needs a larger vocabulary database of foreign idiom definitions.

C:-The Student Model: It must implement a feature to penalise the student's overall mastery score.

D:- The Interface Model: It must integrate a robust acoustic speech-processing layer trained on diverse dialect variations.

Correct Answer:- Option-D

**Question41:-**A high school implements an automated LMS feature that sends immediate text alerts to parents whenever a student's calculated course grade drops to a C. After a semester, data shows that while parent portal logins spiked, student anxiety increased significantly, and overall grades did not improve. Which foundational concept of learning analytics did the school miscalculate?

A:-The LMS algorithm failed to calculate the statistical weight of unsubmitted future assignments.

B:-Data security protocols were breached by sending information over standard cellular networks.

C:-The school confused operational data monitoring with an actionable, supportive pedagogical intervention.

D:-Parents lack the necessary user permissions to view real-time grading rubrics within an educational LMS.

Correct Answer:- Option-C

**Question42:-**Context : A Science department is auditing its digital ecosystem to ensure that each technological framework directly supports a specific pedagogical need.

Instructions : Match the Educational Technology Framework/Tool (Column A) with its most appropriate Science classroom application (Column B) based on its primary pedagogical utility.

Column A  
(Technology)

Column B (Science Classroom Application)

## Framework/Tool

- |  |  |
|--|--|
| 1. Flipped classroom                     | (a) Students securely view an embedded interactive Web 2.0 simulation inside their course page, which automatically sends their lab module scores back to the teacher's central gradebook via an LTI protocol            |
| 2. Immersive Virtual Reality             | (b) An adaptive software program analyses a student's specific error while they balance chemical equations, diagnoses their misconception about conservation of mass, and immediately serves them targeted, custom hints |
| 3. Blended Learning                      | (c) Students watch a short video lecture on tectonic plates at home, allowing them to spend the entire next face-to-face class period actively collaborating on a physical rock-classification lab.                      |
| 4 Moodle Web 2.0 Tools (LTI Integration) | (d) Students wear headsets to safely walk through a 3D, scale-model visualisation of a nuclear reactor core to observe subatomic particle collisions without any physical hazard   |
| 5 Learning Management System (LMS)       | (e) A station-rotation model where Physics students spend 20 minutes doing a hands-on pendulum experiment, 20 minutes using an online gravity simulator, and 20 minutes in a small-group teacher seminar.                |
| 6 Intelligent Tutoring System (ITS)      | (f) An overarching administrative platform used by a school district to host course syllabi, track overall student attendance records, distribute final report cards, and manage school-wide enrollments.                |

A:-1-e, 2-f, 3-a, 4-b, 5-c, 6-d

B:-1-c, 2-d, 3-e, 4-a, 5-f, 6-b

C:-1-b, 2-c, 3-d, 4-e, 5-f, 6-a

D:- 1-d, 2-e, 3-f, 4-a, 5-b, 6-c

Correct Answer:- Option-B

**Question43:-**A middle school science teacher introduces the concept of density by giving students blocks of identical sizes but different weights (wood, iron, plastic) and asking them to predict which will float. According to Piagetian theory, several students experience intense cognitive disequilibrium when the heavy wooden block floats. How should the teacher accommodate this process to effectively leverage this transition from concrete to formal operational thinking?

**A:-**Immediately give them the exact formula and have them copy it down to resolve their confusion.

**B:-** Guide students to test more materials, isolate variables (mass vs. volume) and co-construct a new mental schema that separates "heaviness" from "density".

**C:-** Tell the students that their initial prediction was wrong and award points only to those who guessed correctly to motivate better observation.

D:-Revert to an easier topic since the students are clearly not biologically ready for density.

**Correct Answer:- Option-B**

**Question44:-**In a Cognitive constructivist curriculum that emphasises structured learning sequences, active discovery, and the progression of knowledge through distinct modes of representation, which of the following sets components align strictly with Jerome Bruner's theory of cognitive development?

A:-Assimilation, Accommodation, Equilibration and Sensorimotor schemata

B:-Zone of Proximal Development, More Knowledgeable Other, Private speech, and Cultural tools

C:-Enactive representation, Iconic representation, Symbolic representation, and Spiral curriculum

D:- Object permanence, Irreversibility, Egocentrism, and Formal operational logic

**Correct Answer:- Option-C**

**Question45:-**In the context of a project on community resource management, how should a teacher structure the collaborative groups according to Vygotsky's theory in order to optimize peer-to-peer mediation among a socio-economically diverse student body?

A:-Group students by identical socio-economic backgrounds so their shared cultural tools eliminate communication barriers

B:- Place students who lack access to digital technology in a separate group to work on alternative, non-digital tasks

C:-Separate students by standardized test scores to keep their baseline cognitive levels uniform during group work

D:- Form heterogenous groups where students with varying cultural assets and life experiences act as More Knowledgeable Others (MKOs) for each other.

**Correct Answer:- Option-D**

**Question46:-**A teacher uses a socio-scientific issues approach while teaching genetics. Students debate gene editing in relation to disability rights, healthcare inequality, and corporate control of biotechnology. Which Freirean principle is MOST visible here?

A:-Education as memorization of established truths

B:-Dialogue as a means for critical consciousness

C:-Standardization of scientific understanding

D:- Elimination of values from science education

**Correct Answer:- Option-B**

**Question47:-**Ms. Anjali, an 8th-grade science teacher, is planning a unit on chemical bonding. She uploads a series of short interactive videos explaining relevant concepts for students to watch at home. Students also complete 3 online checkpoint quiz so Ms. Anjali can review their understanding beforehand. Next day, she addresses the misconceptions identified from quiz data and gives them molecular modelling kits in groups. The students spend the next 40 minutes of class collaborating to physically build molecules and debating whether specific compounds share or transfer electrons, while Ms. Anjali moves around the room providing targeted guidance. Which of the following pedagogical techniques is she implementing in her science classroom?

A:- Differentiated Instruction with Direct Teaching

B:- Flipped Classroom with Active Inquiry

C:-Tradition Didactic Chalk and Talk Method

D:-Pure Asynchronous Distance Learning

**Correct Answer:- Option-B**

**Question48:-** A school decides to use blended learning for its science classes, combining online video lessons at home with face-to-face group activities in the classroom. Which of the following is the best outcome of using this learning approach?

A:- Students no longer need to attend school in person or interact with their teachers.

B:-Students can learn the basic facts at their own pace online, leaving class time for hands-on experiments and teamwork.

C:- Students spend the entire school day listening to lectures and doing silent textbook reading.

D:-Teachers can stop tracking student progress and let the computer do all the grading.

**Correct Answer:- Option-B**

**Question49:-**A science teacher uses an AI image generator to make pictures of “scientists in a lab” for a lesson plan. He notices that the AI only makes pictures of men. What should the teacher do to be fair and ethical?

A:-Use the biased pictures anyway because the lab equipment looks cool.

B:-Ban all pictures from his classroom forever.

C:-Tell the students that women generally do not work in real science labs.

D:-Change his text prompt to ask for a diverse mix of male and female scientists, and talk to the class about how computers can have bias.

**Correct Answer:- Option-D**

**Question50:-**A school district is evaluating various immersive technologies to enhance their 7th-grade science curriculum. They want a technology that offers *a fully immersive, computer-generated environment where the physical world is completely shut out*, allowing students to feel psychologically present inside a digital simulation of the human circulatory system. Which technology must the district select?

A:-Mixed Reality

B:-360-Degree Video Projection

C:-Augmented Reality

D:-Virtual Reality

**Correct Answer:- Option-D**

**Question51:-**Large scale Science Fair to encourage teachers for implementation of a paradigm shift is a

A:-Informal Channel

B:-Formal Channel

C:-Non-Formal Channel

D:- Incidental Channel

**Correct Answer:- Option-C**

**Question52:-**Challenges of Science Teaching are :

- (i) Learning science in a second language
- (ii) Complicated language of science textbooks
- (iii) Students holding conceptions about natural phenomena
- (iv) Teaching science uniformly for all culture and environment

A:-Only (i, ii, iii)

B:-Only (ii, iii, iv)

C:-Only (i, ii, iv)

D:- Only (i, ii, iii, iv)

**Correct Answer:- Option-D**

**Question53:-**In an ideal education system, a textbook is NOT one of the

A:-Basic tool to unite students

B:-Diverse tools for curricular transaction

C:-Primary instruments for universalization of good science education in the country

D:-Tool to realize the basic curricular objectives of different stages

**Correct Answer:- Option-A**

**Question54:-**As given in NEP 2020, training cadres of the following subject teachers to teach Science bilingually at schools across the country are

A:-Science and Social Science

B:-Science and Mathematics

C:-Science and Craft

D:-Science and Vocational Education

**Correct Answer:- Option-B**

**Question55:-**The following approach is the accepted paradigm for science education in NCF 2005

A:-Lecture method

B:-Demonstration method

C:-Activity Based teaching

D:-Drama pedagogy

**Correct Answer:- Option-C**

**Question56:-**The full form of CLASS is

A:-Computer Literacy and Studies in Schools

B:-Computer Library and Science in Schools

C:-Computer Literacy in Science in Schools

D:-Computer in Library Science in Schools

**Correct Answer:- Option-A**

**Question57:-**A science club at a school should be created with basic facilities like

(i) simple tools

(ii) measuring instruments

(iii) a modest library

A:- (i) and (ii)

B:-(ii) and (iii)

C:-(iii) and (i)

D:-(i), (ii) and (iii)

Correct Answer:- Option-D

Question58:-Children's Science Congress is organized by

A:-NCERT

B:-NCSM

C:-NCSTC

D:-NCTE

Correct Answer:- Option-C

Question59:-What does Science Teacher not require during teaching in school?

A:-Laboratory work

B:-Library references

C:-Literary writing

D:-Field surveys

Correct Answer:- Option-C

Question60:-As per NCFTE 2009, Science Teaching is kept under the following section

A:-Foundations of Education

B:-Learner Studies

C:-Educational Studies

D:-Curriculum and Pedagogy

Correct Answer:- Option-D

Question61:-Alginic acid is commercially important products extracted primarily from which class of alga?

A:-Green Alga

B:-Brown Alga

C:-Red Alga

D:-Blue-Green Alga

Correct Answer:- Option-B

Question62:-Which of the following statement is best related to the alga *Karenia brevis*?

A:-Rich source of Vitamin-A

B:-An unicellular hard shelled alga

C:-An example for parasitic alga

D:-An alga responsible for harmful algal bloom and red tide

Correct Answer:- Option-D

Question63:-Why bryophytes are commonly referred to as the 'amphibians of the plant kingdom'?

A:-They can survive in both extreme hot and freezing environment

B:-They possess both roots and vascular tissues

C:-They live on land but require Water for sexual reproduction/ fertilization

D:-They are transition from a freshwater frog like ancestor

Correct Answer:- Option-C

Question64:-Among the four Rhodophycean algae listed: *Lemanea*, *Thorea*, *Batrachospermum* and *Porphyridium*, which one is unique in terms of thallus structure and habitat?

A:-*Lemanea*

B:-*Thorea*

C:-*Batrachospermum*

D:-*Porphyridium*

Correct Answer:- Option-D

Question65:-Which bryophyte is widely used, by gardeners and floriculturists because of its high water retention capacity?

A:-*Funaria*

B:-Marchantia

C:-Sphagnum

D:-Riccia fluitense

Correct Answer:- Option-C

Question66:-Match the following

Column A (Fungal Group)	Column B (Thallus/Septal Characteristic)
I Phylum Zygomycota	a. Septate mycelium characterized by simple septal pores
II Phylum Ascomycota	b. Highly developed septate mycelium possessing complex dolipore septa
III. Phylum Basidiomycota	c. An artificial category of fungi lacking a known sexual stage
IV. Mito-spore Fungi	d. Coenocytic vegetative mycelium

Select the correct matching sequence :

A:-I-d, II-a, III-b, IV-c

B:-I-c, II-b, III-a, IV-d

C:-I-a, II-d, III-b, IV-c

D:-I-b, II-a, III-c, IV-d

Correct Answer:- Option-A

Question67:-

Analyze the following statements regarding a stratified foliose lichen thallus :

Statement (i) : The upper cortex consists of tightly packed, pseudoparenchymatous fungal tissue that functions primarily as a protective layer.

Statement (ii) : The medulla is the thickest internal layer and is composed of a loose cottony network of hydrophobic fungal hyphae optimized for gas exchange and water storage.

Statement (iii) : Photosynthesis occurs throughout all layers of the thallus because the photobiont cells are uniformly distributed from the upper cortex to the lower cortex.

Which of the above statements are true?

A:-(i) only

B:-(i) and (ii) only

C:-(ii) and (iii) only

D:-All of the above (i, ii, and iii)

Correct Answer:- Option-B

**Question68:**-The lifecycle of a typical mushroom involves transitions between distinct nuclear phases. Which of the following pathways represents the correct chronological sequence of events characterizing sexual reproduction in Basidiomycota?

**A:-**

Plasmogamy ---> Karyogamy ---> Dikaryotization ---> Meiosis ---> Basidiospore Production

**B:-**Plasmogamy ---> Dikaryotization ---> Meiosis ---> Karyogamy ---> Basidiospore Production

**C:-**Karyogamy ---> Plasmogamy --> Dikaryotization ---> Meiosis ---> Basidiospore Production

**D:-**Plasmogamy ---> Dikaryotization ---> Karyogamy ---> Meiosis ---> Basidiospore Production

**Correct Answer:- Option-D**

**Question69:**-During the active discharge of a ballistospore, what physical phenomenon directly generates the force required to launch the spore off its sterigma?

**A:-**The sudden build up and explosive release of hydrostatic turgor pressure within the basidium.

**B:-**The rapid evaporation of water from the spore surface, creating a vacuum force.

**C:-**The sudden shifting of the centre of gravity caused by the surface-tension fusion of Buller's drop with the adaxial drop on the spore.

**D:-**Mechanical contraction of the sterigma acting like a microscopic Spring.

**Correct Answer:- Option-C**

**Question70:**- Regarding acellular infectious agents, all the following statements are true EXCEPT

**A:-**Prions are completely devoid of nucleic acids and cause disease by altering the conformational folding of normal cellular proteins into a  $\beta$ -sheet-rich pathogenic form.

**B:-**Viroids are small, covalently closed, circular single-stranded RNA molecules that lack any protein capsid.

**C:-**Viruses can contain both double-stranded DNA and double-stranded RNA simultaneously within a single vegetative virion core.

**D:-** Viroids are primarily plant pathogens that do not code for any functional proteins, operating instead via RNA silencing pathways.

**Correct Answer:- Option-C**

**Question71:-**When testing municipal drinking water for the presence of *fecal coliforms* using standard multi-tube fermentation, what is the correct analytical sequence of testing phases?

A:-Confirmed Test ---> Presumptive Test ---> Completed Test

B:-Presumptive Test ---> Confirmed Test ---> Completed Test

C:-Completed Test ---> Presumptive Test ---> Confirmed Test

D:-Presumptive Test ---> Completed Test ---> Confirmed Test

**Correct Answer:- Option-B**

**Question72:-**Match the following :

Column A (Microbial Group)

Column B (Molecular/Cytological Characteristic)

- |                    |  |
|--------------------|--|
| I. Archaeobacteria | a. Filamentous, branching prokaryotic growth habit with a high G+C genomic ratio.          |
| II. Mollicutes     | b. Plasma membranes structurally composed of ether-linked isoprenoid lipids.               |
| III. Actinomycetes | c. Thick-walled heterocysts containing the oxygen-sensitive enzyme nitrogenase.            |
| IV. Cyanobacteria  | d. Complete lack of a cell wall, bound only by a three-layered sterol-containing membrane. |

Select the correct matching sequence:

A:-I-c, II-d, III-b, IV-a

B:-I-b, II-a, III-d, IV-c

C:-I-d, II-b, III-a, IV-c

D:-I-b, II-d, III-a, IV-c

**Correct Answer:- Option-D**

**Question73:-**Analyse the following statements regarding the structure of the bacterial cell envelope :

Statement (i): Gram-negative bacteria possess an asymmetric outer membrane where the outer leaflet is rich in Lipopolysaccharides, containing Lipid A which acts as an endotoxin.

Statement (ii): The plasma membrane of all true bacteria contains sterols to maintain structural fluidity, exactly like eukaryotic membranes.

Statement (iii): Gram-positive cell walls are characterized by a thick peptidoglycan layer cross-linked with teichoic and lipoteichoic acids.

Which of the above statements are true?

A:-(i) only

B:-(ii) and (iii) only

C:-(i) and (iii) only

D:-All of the above (i, ii, and iii)

Correct Answer:- Option-C

**Question74:-**There are two statements marked as Assertion (A) and Reason (R). Choose the CORRECT answer.

Assertion (A): In pteridophytes, the sporophyte is the dominant and independent plant body.

Reason (R) : The gametophyte in pteridophytes is photosynthetic and long-lived.

A:-Both A and R are true and R correct explanation of A.

B:-Both A and R are true but R is not the correct explanation of A.

C:-A is true but R is false.

D:-A is false but R is true.

Correct Answer:- Option-C

**Question75:-**

Match the following and choose the CORRECT answer.

(a) Club moss      i. *Adiantum*

(b) Spike moss    ii. *Cyathea*

(c) Tree fern      iii. *Selaginella*

(d) Walking fern iv. *Lycopodium*

A:-

(a) (b) (c) (d)

i   ii   iii   iv

B:-

(a) (b) (c) (d)

ii   iv   i   iii

C:-

(a) (b) (c) (d)

iii   i   iv   ii

D:-

(a) (b) (c) (d)

iv   iii   ii   i

Correct Answer:- Option-D

**Question76:-**The primitive, extinct gymnosperm order that aids as the evolutionary connecting link between Pteridophytes and advanced group of Gymnosperms is

A:-Cycadales

B:-Cycadotfilicales

C:-Coniferales

D:-Benncttiales

Correct Answer:- Option-B

**Question77:-**Which among the following is TRUE?

(i) The vascular anatomy of both pteridophytes and gymnosperms show phloem devoid of companion cells.

(ii) The endosperm formed after fertilization in both pteridophytes and gymnosperms.

(iii) Both pteridophytes and gymnosperms exhibit alternation of generations with a dominant sporophytic phase.

(iv) Most gymnosperms produce Manoxylic wood. characterized by few xylem parenchyma cells and thick-walled trachieds.

A:-(i) only

B:-(i) and (iii)

C:-(ii) and (iv)

D:-(iv) only

Correct Answer:- Option-B

**Question78:-**Saccus seen in Pinus is

A:-Needle-shaped leaves

B:-A specialized archegonial cell

C:-Stamen-like leaf segment

D:-Wing-like extension of a pollen grain

Correct Answer:- Option-D

**Question79:-**A dictyostele is characterized by :

A:-The presence of overlapping leaf gaps

B:-The transformation of central tracheary elements into parenchyma

C:-Heavy secondary growth

D:-Star-shaped stele

Correct Answer:- Option-A

Question80:-The gymnosperm group found exclusively as fossils is

A:-Cycadales

B:-Coniferales

C:-Bennettitales

D:-Ginkgoales

Correct Answer:- Option-C

Question81:-The number of nucleotides in Okazaki fragments during Prokaryotic replication is

A:-10-20

B:-100-200

C:-1000-2000

D:-50-500

Correct Answer:- Option-C

Question82:-The start codon to which the ribosome attaches to initiate translation is

A:-AUG

B:-UAA

C:-UGA

D:-UAG

Correct Answer:- Option-A

Question83:-Tay-Sachs disease, a lysosomal storage disease occurs due to the deficiency of the enzyme

A:- $\alpha$  Galactosidase A

B:-Glucocerebrosidase

C:-Ceramidase

D:-Hexosaminidase A

Correct Answer:- Option-D

Question84:-The DNA damage check point that prevents entry into mitosis by maintaining Weel activity and Cdc 25 inhibition is

A:-G1/S check point

B:-G2/M check point

C:-Spindle Assembly check point

D:-Intra-S check point

Correct Answer:- Option-B

Question85:-Which evidence supports the endosymbiotic origin of Mitochondria and chloroplast

A:-Presence of 80S ribosome

B:-Linear DNA without histones

C:-Double membrane and own circular DNA

D:-Ability to undergo meiosis

Correct Answer:- Option-C

Question86:-In amphibian embryos, the grey crescent region is significant because:

- (i) It marks the future dorsal side
- (ii) It determines the site of sperm entry

A:-Only (i) is correct

B:-Only (ii) is correct

C:-(i) and (ii) are correct

D:-Neither (i) nor (ii) is correct

Correct Answer:- Option-C

Question87:-Which of the following sequences is correct during embryogenesis?

A:-Gastrulation → Cleavage → Blastulation

B:-Cleavage → Blastulation → Gastrulation

C:-Blastulation → Cleavage → Organogenesis

D:-Organogenesis → Cleavage → Gastrulation

Correct Answer:- Option-B

Question88:-Determination differs from differentiation because determination:

A:-Is morphologically visible

B:-Occurs after organogenesis

C:-Represents commitment before visible specialization

D:-Occurs only in adult tissues

Correct Answer:- Option-C

Question89:-During cleavage, the nucleocytoplasmic ratio

A:-Decreases continuously

B:-Remains constant

C:-Increases

D:-Becomes zero

Correct Answer:- Option-C

Question90:-In the Bohr effect :

A:-Increased pH reduces oxygen affinity of haemoglobin

B:-Increased CO<sub>2</sub> enhances oxygen release from haemoglobin

C:-Oxygen dissociation curve shifts left

D:-Carbaminohaemoglobin formation decreases

Correct Answer:- Option-B

Question91:-In neurons, the refractory period is mainly due to:

A:-Closure of potassium channels

B:-Inactivation of voltage-gated sodium channels

C:-Increased chloride permeability only

D:-Neurotransmitter depletion

Correct Answer:- Option-B

Question92:-Chloride shift in RBCs is important for:

A:-Oxygen transport only

B:-Carbon dioxide transport

C:-Platelet aggregation

D:-ATP synthesis

Correct Answer:- Option-B

Question93:-During depolarization of a neuron:

(i) Sodium influx increases

(ii) Membrane potential becomes less negative

A:-Only (i) is correct

B:-Only (ii) is correct

C:-(i) and (ii) are correct

D:-Neither (i) nor (ii) is correct

Correct Answer:- Option-C

Question94:-In a large, randomly mating population, the frequency of a homozygous recessive genotype is 0.16. Assuming the population is in Hardy-Weinberg equilibrium, the frequency of the dominant allele is

A:-0.40

B:-0.60

C:-0.80

D:-0.20

Correct Answer:- Option-B

Question95:-Which type of speciation involves a continuous gradient of environmental conditions, without any geographic barrier?

A:-Allopatric speciation

B:-Peripatric speciation

C:-Parapatric speciation

D:-Sympatric speciation

Correct Answer:- Option-C

Question96:-The long-term increase in antibiotic-resistant bacteria is a classic example of which type of selection?

A:-Stabilizing selection

B:-Disruptive selection

C:-Sexual selection

D:-Directional selection

Correct Answer:- Option-D

Question97:-Which of the following best defines a transversion mutation?

A:-Replacement of a purine with another purine

B:-Replacement of a pyrimidine with another pyrimidine

C:-Replacement of a purine with a pyrimidine or vice versa

D:-Insertion of a single base pair, altering the reading frame

Correct Answer:- Option-C

Question98:-In humans, a somatic cell contains \_\_\_\_\_ chromosomes.

A:-44

B:-46

C:-48

D:-26

Correct Answer:- Option-B

Question99:-If the blood group of the father is A and that of the mother is B, then what would be the possible blood group of the child?

A:-A or B

B:-AB

C:-A, B or AB

D:-A, B, AB or O

Correct Answer:- Option-D

Question100:-During which specific meiotic stage does crossing over occur?

A:-Zygotene

B:-Pachytene

C:-Diplotene

D:-Diakinesis

Correct Answer:- Option-B