

| SUBJECT | TIME                     |
|---------|--------------------------|
| BIOLOGY | 10.30 A.M. TO 11.50 A.M. |

| MAXIMUM MARKS | TOTAL DURATION | MAXIMUM TIME FOR ANSWERING |
|---------------|----------------|----------------------------|
| 60            | 80 MINUTES     | 70 MINUTES                 |

| MENTION YOUR<br>CET NUMBER | QUESTION BOOKLET DETAILS |               |
|----------------------------|--------------------------|---------------|
|                            | VERSION CODE             | SERIAL NUMBER |
|                            | A - 1                    | 416449        |

**DO's:**

1. Check whether the CET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This Question Booklet is issued to you by the invigilator after the 2<sup>nd</sup> Bell i.e., after 10.30 a.m.
3. The Serial Number of this question booklet should be entered on the OMR answer sheet.
4. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

**DON'TS:**

1. **THE TIMING MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED/SPOILED.**
2. Until the 3<sup>rd</sup> Bell is rung at 10.40 a.m.:
  - Do not remove the seal / staple present on the right hand side of this question booklet.
  - Do not look inside this question booklet.
  - Do not start answering on the OMR answer sheet.

**INSTRUCTIONS TO CANDIDATES**

1. This question booklet contains 60 questions and each question will have four different options / choices.
2. After the 3<sup>rd</sup> Bell is rung at 10.40 a.m., remove the seal / staple present on the right hand side of this question booklet and start answering on the OMR answer sheet.
3. During the subsequent 70 minutes:
  - Read each question carefully.
  - Choose the correct answer from out of the four available options / choices given under each question.
  - **Completely darken / shade the relevant circle with a BLUE OR BLACK INK BALL POINT PEN against the question number on the OMR answer sheet.**

**CORRECT METHOD OF SHADING THE CIRCLE ON THE OMR SHEET IS SHOWN BELOW :**



4. Please note that even a minute unintended ink dot on the OMR sheet will also be recognised and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
5. Use the space provided on each page of the question booklet for Rough work AND do not use the OMR answer sheet for the same.
6. After the last bell is rung at 11.50 a.m., stop writing on the OMR answer sheet and affix your **LEFT HAND THUMB IMPRESSION** on the OMR answer sheet as per the instructions.
7. Hand over the OMR ANSWER SHEET to the room invigilator as it is.
8. After separating and retaining the top sheet (KEA Copy), the invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
9. Preserve the replica of the OMR answer sheet for a minimum period of One year.

**B****SEAL**

1. Which of the following hormones **does not** naturally occur in plants ?

- (1) IAA                      (2) GA  
(3) ABA                    (4) 2, 4 - D

2. A large quantity of fluid is filtered every day by the nephrons in the kidneys. Only about 1% of it is excreted as urine. The remaining 99% of the filtrate

- (1) is lost as sweat
- (2) is stored in the urinary bladder
- (3) is reabsorbed into the blood
- (4) gets collected in the renal pelvis

### 3. When DNA replication starts

- (1) The hydrogen bonds between the nucleotides of two strands break.
- (2) The phosphodiester bonds between the adjacent nucleotides break.
- (3) The bonds between the nitrogen base and deoxyribose sugar break.
- (4) The leading strand produces okazaki fragments.

4. Fleshy fruits with stony endocarp are called

- (1) Berries                      (2) Pomes  
(3) Drupes                      (4) Capsules

5. Which statement about photosynthesis is **false** ?

- (1) Photosynthesis is a redox process in which water is oxidised and carbon dioxide is reduced.
- (2) The enzymes required for carbon fixation are located only in the grana of chloroplasts.
- (3) In green plants, both PS I and PS II are required for the formation of  $\text{NADPH} + \text{H}^+$ .
- (4) The electron carriers involved in photophosphorylation are located on the thylakoid membranes

## Space For Rough Work

6. Darwinism explains all the following **except**
- Organisms tend to produce more number of offspring than can survive
  - Offspring with better traits that overcome competition are best suited for the environment
  - Variations are inherited from parents to offspring through genes
  - Within each species, there are variations
7. Pollen grains of a plant whose  $2n = 28$  are cultured to get callus by tissue culture method. What would be the number of chromosomes in the cells of the callus ?
- 21
  - 14
  - 56
  - 28
8. A true breeding plant producing red flowers is crossed with a pure plant producing white flowers. Allele for red colour of flower is dominant. After selfing the plants of first filial generation, the proportion of plants producing white flowers in the progeny would be
- $\frac{1}{4}$
  - $\frac{1}{3}$
  - $\frac{1}{2}$
  - $\frac{3}{4}$
9. Which of the following prevents the conversion of prothrombin to thrombin in an undamaged blood vessel ?
- Calcium ions
  - Thromboplastin
  - Fibrinogen
  - Heparin
10. The characteristic that is shared by urea, uric acid and ammonia is/are
- They are nitrogenous wastes
  - They all need very large amount of water for excretion
  - They are all equally toxic
  - They are produced in the kidneys
- A and D
  - A, C and D
  - A only
  - A and C

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Space For Rough Work

11. A RBC and a plant cell (with thick cell wall) are placed in distilled water. The solute concentration is the same in both the cells. What changes would be observed in them ?

- (1) The RBC would increase in size and burst while the plant cell would remain about the same size.
- (2) The plant cell would increase in size and burst while the RBC would remain about the same size.
- (3) Both plant cell and RBC would decrease in size and collapse.
- (4) Both plant cell and RBC would not undergo any change.

12. Which of the following hormones **does not** contain a polypeptide ?

- (1) Oxytocin
- (2) Insulin
- (3) Antidiuretic hormone
- (4) Prostaglandin

13. Ribose sugar is present in

- (1) RNA only
- (2) RNA polymerase and ATP
- (3) RNA and ATP
- (4) RNA polymerase, RNA and ATP

14. Most of the endangered species are the victims of

- (1) Habitat destruction
- (2) Over-hunting
- (3) Acid rain
- (4) Competition with introduced species

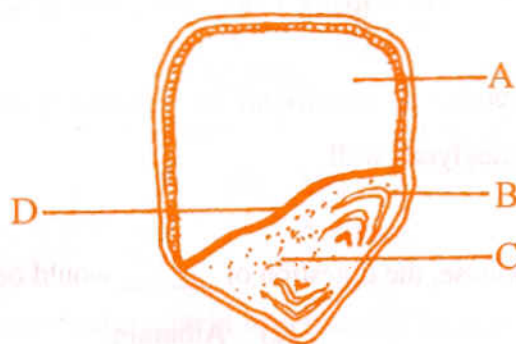
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Space For Rough Work

15. Damage to thymus in a child may lead to

- (1) a reduction in the haemoglobin content in blood
- (2) a reduction in the amount of plasma proteins
- (3) loss of antibody mediated immunity
- (4) loss of cell mediated immunity

16. The diagram of the section of a maize grain is given below. Identify the parts labelled A, B, C and D.



- (1) A – Cotyledon, B – Coleoptile, C – Scutellum, D – Epithelium
- (2) A – Endosperm, B – Coleoptile, C – Scutellum, D – Epithelium
- (3) A – Endosperm, B – Coleorrhiza, C – Scutellum, D – Epithelium
- (4) A – Endosperm, B – Coleoptile, C – Scutellum, D – Aleurone layer

17. Examples for lateral meristems are

- (1) Fascicular cambium and procambium
- (2) Procambium and dermatogen
- (3) Fascicular cambium and cork cambium
- (4) Phellogen and procambium

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Space For Rough Work

18. Vitellogenesis occurs during the formation of

- (1) Oogonial cell in the Graafian follicle
- (2) Ootid in the fallopian tube
- (3) Secondary oocyte in the fallopian tube
- (4) Primary oocyte in the Graafian follicle

19. A bacterium is capable of withstanding extreme heat, dryness and toxic chemicals. This indicates that it is probably able to form

- (1) Endospores
- (2) Endotoxins
- (3) Endogenous buds
- (4) A thick peptidoglycan wall

20. In the absence of enterokinase, the digestion of \_\_\_\_\_ would be affected in our intestine.

- (1) Amino acid
- (2) Albumin
- (3) Starch
- (4) Maltose

21. The greatest threat to genetic diversity in agricultural crops is

- (1) extensive mixed cropping
- (2) introduction of high yielding varieties
- (3) extensive use of fertilisers
- (4) extensive use of insecticides and pesticides

22. *Nosema bombycis* which causes pebrine in silk worms is a

- (1) Virus
- (2) Bacterium
- (3) Protozoan
- (4) Fungus

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Space For Rough Work

23. Palaeontologists unearthed a human skull during excavation. A small fragment of the scalp tissue was still attached to it. Only little DNA could be extracted from it. If the genes of the ancient man need to be analysed, the best way of getting sufficient amount of DNA from this extract is
- (1) Subjecting the DNA to polymerase chain reaction
  - (2) Subjecting the DNA to gel electrophoresis
  - (3) Treating the DNA with restriction endonucleases
  - (4) Hybridising the DNA with a DNA probe
24. Which of the following would be in insignificant amount in xylem sap ?
- (1) Nitrates
  - (2) Phosphates
  - (3) Water
  - (4) Sugar
25. If the person shows the production of interferons in his body, chances are that he is suffering from
- (1) Malaria
  - (2) Measles
  - (3) Tetanus
  - (4) Anthrax
26. The RER in the cell synthesised a protein which would be later used in building the plasma membrane. But it is observed that the protein in the membrane is slightly different from the protein made in the RER. The protein was probably modified in another cell organelle. Identify that organelle in the given diagram.



- (1) A
- (2) B
- (3) C
- (4) D

Space For Rough Work

27. The respiratory quotient during cellular respiration would depend on
- (1) the nature of the substrate
  - (2) the amount of carbon dioxide released
  - (3) the amount of oxygen utilised
  - (4) the nature of enzymes involved
28. Which of the following is **not** a green house gas ?
- (1) Carbon monoxide
  - (2) Methane
  - (3) Oxygen
  - (4) Water vapour
29. Both husband and wife have normal vision though their fathers were colour blind and mothers did not have any gene for colour blindness. The probability of their daughters becoming colour blind is
- (1) 75 %
  - (2) 0 %
  - (3) 25 %
  - (4) 50 %
30. An animal which has both exoskeletal and endoskeletal structures is
- (1) Tortoise
  - (2) Frog
  - (3) Jelly fish
  - (4) Fresh water mussel
31.  $2n = 16$  in a primary spermatocyte which is in metaphase of first meiotic division. What shall be the total number of chromatids in each of the secondary spermatocyte ?
- (1) 8
  - (2) 16
  - (3) 24
  - (4) 32
32. Identify the group which includes animals all of which give birth to young ones directly.
- (1) Platypus, Penguin, Bat, Hippopotamus
  - (2) Shrew, Bat, Kiwi, Cat
  - (3) Lion, Whale, Ostrich, Bat
  - (4) Dolphin, Kangaroo, Bat, Cat

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Space For Rough Work

33. Compare the statements A and B :

**Statement A :** Blood sugar level falls rapidly after hepatectomy.

**Statement B :** The glycogen of the liver is the principal source of blood sugar.

**Select the correct description :**

- (1) Statement A is correct and B is wrong.
- (2) Statement A is wrong and B is correct.
- (3) Both the statements A and B are correct and B is not the reason for A.
- (4) Both the statements A and B are correct and B is the reason for A.

34. What is/are true about heart wood ?

- A. It does not help in water conduction.
- B. It is also called alburnum.
- C. It is dark in colour but very soft.
- D. It has tracheary elements which are filled with tannin, resin, etc.

- (1) A and D
- (2) B and D
- (3) A, B and C
- (4) B, C and D

35. Compare the statements A and B.

**Statement A :** Auxins promote apical dominance by suppressing the activity of lateral buds.

**Statement B :** In moriculture, periodic pruning of shoot tips is done to make mulberry plants bushy.

**Select the correct description :**

- (1) Statement A is correct and B is wrong.
- (2) Statement A is wrong and B is correct.
- (3) Both the statements A and B are correct and A is not the reason for B.
- (4) Both the statements A and B are correct and A is the reason for B.

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**Space For Rough Work**

36. Bryophytes resemble algae in the following aspects :

- (1) Differentiation of plant body into root, stem and leaves and autotrophic nutrition.
- (2) Thallus like plant body, presence of roots and autotrophic nutrition.
- (3) Thallus like plant body, lack of vascular tissues and autotrophic nutrition.
- (4) Filamentous body, presence of vascular tissues and autotrophic nutrition.

37. Compare the statements A and B .

**Statement A :** A monocistronic mRNA can produce several types of polypeptide chains.

**Statement B :** The terminator codon is present on the mRNA.

**Select the correct description :**

- (1) Statement A is correct and B is wrong.
- (2) Statement A is wrong and B is correct.
- (3) Both the statements A and B are correct.
- (4) Both the statements A and B are wrong.

38. Stoma opens when

- (1) Guard cells swell by endosmosis due to influx of hydrogen ions (protons)
- (2) Guard cells swell by endosmosis due to efflux of potassium ions.
- (3) Guard cells swell due to a decrease in their water potential.
- (4) Guard cells swell due to an increase in their water potential.

39. Which of the following is properly matched ?

- (1) Echinodermata – Asteroidea – Star fish
- (2) Arthropoda – Insecta – Spider
- (3) Mollusca – Cephalopoda – Unio
- (4) Platyhelminthes – Trematoda – Planaria

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Space For Rough Work

40. A man is admitted to a hospital. He is suffering from an abnormally low body temperature, loss of appetite and extreme thirst. His brain scan would probably show a tumor in

- |                  |                       |
|------------------|-----------------------|
| (1) Pons         | (2) Cerebellum        |
| (3) Hypothalamus | (4) Medulla Oblongata |

41. Identify the **incorrect** statement with respect to Calvin cycle.

- (1) The first stable intermediate compound formed is phosphoglycerate.
- (2) 18 molecules of ATP are synthesised during carbon fixation.
- (3)  $\text{NADPH} + \text{H}^+$  produced in light reaction is used to reduce diphosphoglycerate.
- (4) The carboxylation of RuBP is catalysed by rubisco.

42. The agents which are known to cause CJD are

- |                         |                        |
|-------------------------|------------------------|
| (1) A class of bacteria | (2) A class of viruses |
| (3) Fungi               | (4) Protein particles  |

43. In crop improvement programmes, virus-free clones can be obtained through

- |                        |                    |
|------------------------|--------------------|
| (1) Hybridization      | (2) Embryo culture |
| (3) Shoot apex culture | (4) Grafting       |

44. A person is suffering from frequent episodes of nasal discharge, nasal congestion, reddening of eyes and watery eyes. These are the symptoms of

- |                         |              |
|-------------------------|--------------|
| (1) Bronchitis          | (2) Rhinitis |
| (3) Bronchial carcinoma | (4) Cyanosis |

45. Some important events in the human female reproductive cycle are given below. Arrange the events in a proper sequence.

A – Secretion of FSH, B – Growth of corpus luteum, C – Growth of the follicle and oogenesis, D – Ovulation, E – Sudden increase in the levels of LH

- |                                                                 |                                                                 |
|-----------------------------------------------------------------|-----------------------------------------------------------------|
| (1) $A \rightarrow C \rightarrow E \rightarrow D \rightarrow B$ | (2) $A \rightarrow D \rightarrow C \rightarrow E \rightarrow B$ |
| (3) $B \rightarrow A \rightarrow C \rightarrow D \rightarrow E$ | (4) $C \rightarrow A \rightarrow D \rightarrow B \rightarrow E$ |

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Space For Rough Work

46. Compare the statements A and B.

**Statement A :** Ranikhet disease is the disease of poultry.

**Statement B :** It is caused by a virus.

**Select the correct description :**

- (1) Statement A is correct and B is wrong.
- (2) Statement A is wrong and B is correct.
- (3) Both the statements A and B are wrong.
- (4) Both the statements A and B are correct.

47. The offspring produced from a marriage have only O or A blood groups. Of the genotypes given below, the possible genotypes of the parents would be

- (1)  $I^O I^O$  and  $I^O I^O$
- (2)  $I^A I^A$  and  $I^O I^O$
- (3)  $I^A I^O$  and  $I^O I^O$
- (4)  $I^A I^A$  and  $I^A I^O$

48. A dorsal horn is present on the \_\_\_\_\_ of mulberry silk worm (caterpillar).

- (1) 8<sup>th</sup> abdominal segment
- (2) 5<sup>th</sup> abdominal segment
- (3) 2<sup>nd</sup> thoracic segment
- (4) Head

49. A plant has an androecium with monadelphous stamens, monothecous and reniform anthers. The corolla exhibits contorted aestivation.

The plant could be

- (1) *Vinca*
- (2) *Nerium*
- (3) *Hibiscus*
- (4) *Rauwolfia*

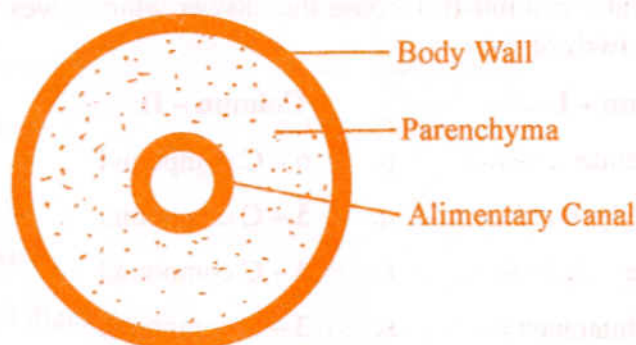
50. Transpiration facilitates

- (1) Opening of stomata
- (2) Absorption of water by roots
- (3) Excretion of minerals
- (4) Electrolyte balance

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Space For Rough Work

51. The cross section of the body of an invertebrate is given below. Identify the animal which has this body plan.



- (1) Round worm                      (2) Planaria  
(3) Earthworm                      (4) Cockroach
52. In an experiment demonstrating the evolution of oxygen in Hydrilla, Sodium bicarbonate is added to water in the experimental set-up. What would happen if all other conditions are favourable ?
- (1) Amount of oxygen evolved increases as the availability of carbon dioxide increases.  
(2) Amount of oxygen evolved decreases as the availability of carbon dioxide increases.  
(3) Amount of oxygen evolved increases as carbon dioxide in water is absorbed by sodium bicarbonate.  
(4) Amount of oxygen evolved decreases as carbon dioxide in water is absorbed by sodium bicarbonate.
53. Which substance is in higher concentration in blood than in glomerular filtrate ?
- (1) Glucose                      (2) Urea  
(3) Plasma proteins                      (4) Water
54. All the following are included under *in situ* conservation except
- (1) Biosphere reserve                      (2) National park  
(3) Sanctuary                      (4) Botanical garden

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Space For Rough Work

55. Match the compounds given in column-I with the number of carbon atoms present in them which are listed under column-II. Choose the answer which gives the correct combination of alphabets of the two columns.

| Column – I |                         | Column – II |                |
|------------|-------------------------|-------------|----------------|
| A.         | Oxaloacetate            | p.          | 6 – C compound |
| B.         | Phosphoglyceraldehyde   | q.          | 5 – C compound |
| C.         | Isocitrate              | r.          | 4 – C compound |
| D.         | $\alpha$ -Ketoglutarate | s.          | 3 – C compound |
|            |                         | t.          | 2 – C compound |

(1) A = r, B = s, C = p, D = q      (2) A = r, B = t, C = p, D = q

(3) A = q, B = s, C = p, D = t      (4) A = s, B = t, C = q, D = r

56. Identify the correctly matched pair/pairs of the germ layers and their derivatives :

- A. Ectoderm – Epidermis  
 B. Endoderm – Dermis  
 C. Mesoderm – Muscles  
 D. Mesoderm – Notochord  
 E. Endoderm – Enamel of teeth

(1) A, B, C and E only      (2) A and D only  
 (3) A and B only      (4) A, C and D only

57. Identify the correct statement :

- (1) The age of the plant can be determined by its height.  
 (2) Healing of damaged tissue is because of the activity of sclerenchyma cells.  
 (3) Grafting is difficult in monocot plants as they have scattered vascular bundles.  
 (4) Because of marked climatic variations, plants growing near the sea shore do not produce annual rings.

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Space For Rough Work

58. Blood stains are found at the site of a murder. If DNA profiling technique is to be used for identifying the criminal, which of the following is ideal for use ?

- (1) Erythrocytes                      (2) Leucocytes
- (3) Platelets                          (4) Serum

59. During endocytosis,

- (1) the cell digests itself
- (2) the cell engulfs and internalises materials using its membrane
- (3) the cell enables the extracellular digestion of large molecules
- (4) the cell divides its cytoplasm during mitosis

60. Match the names of the economically important plants (or their products) listed in Column-I with the families to which they belong given in column-II. Choose the answer which gives the correct combination of alphabets of the two columns :

**Column – I**

**Column – II**

- |              |                  |
|--------------|------------------|
| A. Sunflower | p. Acanthaceae   |
| B. Tulsi     | q. Compositae    |
| C. Coffee    | r. Labiatae      |
| D. Vasaka    | s. Rubiaceae     |
|              | t. Euphorbiaceae |

- (1) A = q, B = r, C = s, D = p
- (2) A = q, B = s, C = p, D = t
- (3) A = s, B = r, C = p, D = q
- (4) A = r, B = t, C = s, D = q

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Space For Rough Work