

# COMMON ENTRANCE TEST - 2010

| DATE          | SUBJECT        | TIME                       |
|---------------|----------------|----------------------------|
| 28-04-2010    | BIOLOGY        | 10.30 AM to 11.50 AM       |
| 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                    | 149809        |

## DOs :

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 AND 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.

## IMPORTANT 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 BALLPOINT PEN against the question number on the OMR answer sheet.

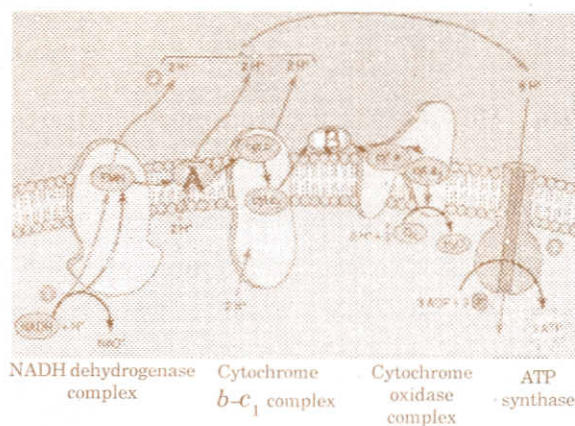
CORRECT METHOD OF SHADING THE CIRCLE ON THE OMR SHEET IS AS SHOWN BELOW :



4. Please note that even a minute unintended ink dot on the OMR sheet will also be recognized 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. 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.

## BIOLOGY

1. Due to nondisjunction of chromosomes during spermatogenesis, sperms carry both sex chromosomes (22A + XY) and some sperms do not carry any sex chromosome (22A + O). If these sperms fertilize normal eggs (22A + X), what types of genetic disorders appear among the offsprings?
  - 1) Down's syndrome and Klinefelter's syndrome
  - 2) Turner's syndrome and Klinefelter's syndrome
  - 3) Down's syndrome and Cri-du-chat syndrome
  - 4) Down's syndrome and Turner's syndrome
2. When a fresh water protozoan is placed in marine water, .....
  - 1) the number of contractile vacuoles increase.
  - 2) the contractile vacuoles become bigger in size.
  - 3) the contractile vacuoles remain unchanged.
  - 4) the contractile vacuoles disappear.
3. Which one of the following pairs is an example for lateral meristem?
  - 1) Interfascicular cambium and phellem
  - 2) Procambium and phelloderm
  - 3) Phellogen and fascicular cambium
  - 4) Phellogen and phelloderm
4. In peritoneal dialysis, .....
  - 1) the blood is not removed from the body and a natural filter is used.
  - 2) the blood is removed from the body and a natural filter is employed.
  - 3) the blood is removed from the body and an artificial filter is employed.
  - 4) the blood is not removed from the body and an artificial filter is used.
5. The following is a scheme showing the electron transport system. Identify the electron carrier molecules indicated as A and B. Choose the correct option.
  - 1) A = Cytochrome C, B = Coenzyme Q
  - 2) A = Coenzyme Q, B = Cytochrome C
  - 3) A = FMN, B = Fe-S protein
  - 4) A = Fe-S protein, B = FMN



(Space for Rough Work)

6. The sugar present in milk is .....
- 1) Sucrose
  - 2) Fructose
  - 3) Lactose
  - 4) Glucose
7. According to Steward's starch hydrolysis theory, which one of the following is the principal reason for the opening of stomata during daytime?
- 1) Conversion of sugar into starch in guard cells.
  - 2) Influx of  $K^+$  ions into guard cells under the influence of ABA hormone.
  - 3) Photosynthetic utilization of  $CO_2$  in guard cells.
  - 4) Efflux of  $K^+$  ions from guard cells under the influence of ABA hormone.
8. Which one of the following processes results in the formation of a clone of bacteria?
- 1) Conjugation
  - 2) Binary fission
  - 3) Transduction
  - 4) Transformation
9. Match the types of immunity listed in Column I with the examples listed in Column II. Choose the answer that gives the correct combination of alphabets of the two columns :

| Column I<br>Types of immunity |                    | Column II<br>Example |                                        |
|-------------------------------|--------------------|----------------------|----------------------------------------|
| A.                            | Natural active     | p.                   | Immunity developed by heredity         |
| B.                            | Artificial passive | q.                   | From mother to foetus through placenta |
| C.                            | Artificial active  | r.                   | Injection of antiserum to travellers   |
| D.                            | Natural passive    | s.                   | Fighting infections naturally          |
|                               |                    | t.                   | Induced by vaccination                 |

- 1) A = t, B = s, C = r, D = p    2) A = s, B = t, C = q, D = r  
 3) A = s, B = r, C = t, D = q    4) A = p, B = q, C = r, D = t
10. How do you differentiate a butterfly from a moth?
- 1) Moth has one pair of wings but butterfly has two pairs of wings.
  - 2) Moth has feathery antennae but butterfly has club shaped antennae.
  - 3) Moth has simple eyes but butterfly has compound eyes.
  - 4) Moth is diurnal but butterfly is nocturnal.

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(Space for Rough Work)

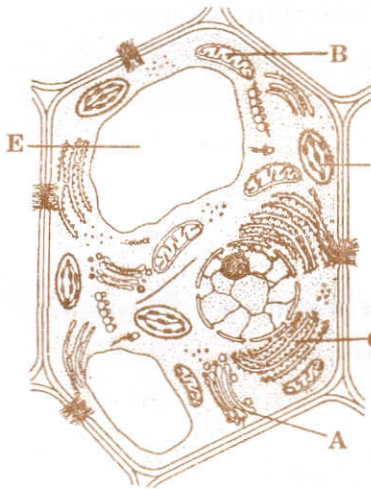
11. Which one of the following statement is *NOT* correct?  
During Protein synthesis, .....

- 1) Tyrosine is coded by UAU and UAC codons.
- 2) Cysteine is coded by UGU and UGC codons.
- 3) UGG codon codes for Tryptophan.
- 4) UAA codon codes for Lysine.

12. In the absence of acrosome, the sperm .....

- 1) cannot get energy
- 2) cannot penetrate the egg
- 3) cannot swim
- 4) cannot get food

13. The diagram of the ultrastructure of a plant cell is given below. Identify the functions of the organelles labelled A, B, C, D, E in the diagram.



- 1) A = Principal director of macromolecular traffic,  
B = Site of oxidative phosphorylation, C = Intracellular transport,  
D = Site of photophosphorylation, E = Storage of cell sap.
- 2) A = Intracellular transport, B = Site of oxidative phosphorylation  
C = Principal director of macromolecular traffic,  
D = Site of photophosphorylation, E = Storage of cell sap.
- 3) A = Storage of cell sap, B = Site of oxidative phosphorylation,  
C = Principal director of macromolecular traffic  
D = Site of photophosphorylation, E = Intracellular transport.
- 4) A = Site of photophosphorylation, B = Storage of cell sap  
C = Intracellular transport, D = Site of oxidative phosphorylation  
E = Principal director of macromolecular traffic.

14. Which one of the following species of earthworm is *NOT* recommended for vermicomposting?

- 1) *Eisenia fetidae*
- 2) *Eudrilus eugeniae*
- 3) *Pheretima Posthuma*
- 4) *Perionyx excavatus*

15. The main aim of the human genome project is .....

- 1) to identify and sequence all the genes present in human DNA.
- 2) to introduce new genes into humans.
- 3) to remove disease causing genes from human DNA.—
- 4) to develop better techniques for comparing two different human DNA samples.

(Space for Rough Work)

16. The species, though insignificant in number, determine the existence of many other species in a given ecosystem. Such species is known as
- 1) Sacred species
  - 2) Endemic species
  - 3) Keystone species
  - 4) Extinct species
17. Compare the statements A and B.  
**Statement A** : Sclerenchyma cells do not have plasmodesmata.  
**Statement B** : The cell walls of some permanent tissues are heavily lignified.  
 Select the correct description :
- 1) Both the statements A and B are wrong.
  - 2) Statement A is correct and B is wrong.
  - 3) Statement A is wrong and B is correct.
  - 4) Both the statements A and B are correct.
18. Which one of the following is *NOT* the reason for very high load of bilirubin in a newborn?
- 1) The liver of the newborn is too young to cope up with the heavy load of bilirubin.
  - 2) Excessive red blood corpuscles in the newborn burst, releasing the bilirubin.
  - 3) Insoluble bilirubin in the intestine is reabsorbed by the blood.
  - 4) Mother's milk contain a high amount of bilirubin.
19. Which one of the following diseases is caused by *Nosema bombycis* in mulberry silkworm?
- 1) Pebrine
  - 2) Muscadine
  - 3) Flacherie
  - 4) Grasserie
20. The following is the scheme showing the path of reflex arc. Identify the different labellings A, B, C, D, E, F in the reflex arc.



- 1) A = Stimulus, B = Receptor, C = Sensory nerve, D = Motor nerve, E = Effector, F = Response
- 2) A = Stimulus, B = Effector, C = Sensory nerve, D = Motor nerve, E = Receptor, F = Response
- 3) A = Stimulus, B = Receptor, C = Motor nerve, D = Sensory nerve, E = Effector, F = Response
- 4) A = Stimulus, B = Effector, C = Motor nerve, D = Sensory nerve, E = Receptor, F = Response

21. Identify the pair that exhibit "Cercinate vernation".
- 1) Equisetum and Selaginella
  - 2) Psilotum and Riccia
  - 3) Riccia and Nephrolepis
  - 4) Nephrolepis and Cycas
22. Pyruvate dehydrogenase complex, needed for the conversion of Pyruvic acid to Acetyl CO-A is located in .....
- 1) Intermembranal space of mitochondria
  - 2) Matrix of mitochondria
  - 3) Cytoplasm
  - 4) Grana of chloroplast
23. The presence of corollary corona, sagittate anthers and dumb-bell shaped stigma are the characteristic features of .....
- 1) *Hibiscus rosa-sinensis*
  - 2) *Musa paradisiaca*
  - 3) *Ravenala madagascariensis*
  - 4) *Catheranthus roseus*
24. Everytime, when the dosage of a drug has to be increased to achieve the same 'kick' that initially occurred in response to a smaller dose, this condition is known as .....
- 1) Tolerance
  - 2) Rebound effect
  - 3) Addiction
  - 4) Withdrawal symptoms
25. DNA gyrase, the enzyme that participates in the process of DNA replication is a type of
- 1) Reverse Transcriptase
  - 2) DNA Topoisomerase
  - 3) DNA Polymerase
  - 4) DNA Ligase

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(Space for Rough Work)

26. Mendel found that the reciprocal crosses yielded identical results. From that he concluded that .....

- 1) sex plays a role in deciding the dominance of a trait.
- 2) there is independent assortment of traits.
- 3) sex has no influence on the dominance of traits.
- 4) there is no dominance of any trait.

27. Compare the statements A and B.

**Statement A :** Synthesis of DNA takes place in the S-phase of interphase.

**Statement B :** Every chromosome, during metaphase, has two chromatids.

Choose 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.

28. Match the animals listed in Column I with their of nature of blood listed in Column II. Choose the answer which gives the correct combination of alphabets of the two columns.

| Column I |           | Column II |                                             |
|----------|-----------|-----------|---------------------------------------------|
| A.       | Man       | p.        | Plasma and cells are colourless             |
| B.       | Earthworm | q.        | Plasma is colourless and nucleated RBC      |
| C.       | Cockroach | r.        | Plasma is colourless and enucleated RBC     |
| D.       | Frog      | s.        | Plasma is red and nucleated, colourless RBC |
|          |           | t.        | Plasma and RBC have haemoglobin.            |

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

29. During Lactic acid fermentation, .....

- 1) neither  $O_2$  is used, nor  $CO_2$  is liberated.
- 2)  $O_2$  is used,  $CO_2$  is liberated.
- 3)  $O_2$  is not used,  $CO_2$  is liberated.
- 4)  $O_2$  is used,  $CO_2$  is not liberated.

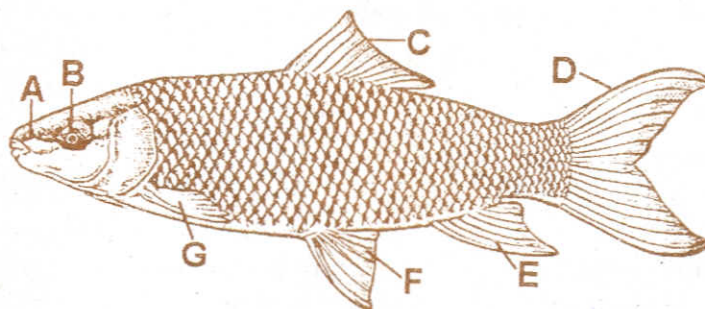
30. Which one of the following is *NOT* the function of insulin?

- 1) Increase the oxidation of glucose in the cells.
- 2) Increases the permeability of cell membrane to glucose.
- 3) Initiates the formation of hepatic glycogen from excess of glucose.
- 4) Initiates the conversion of glycogen to glucose.

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(Space for Rough Work)

31. Which one of the following is a unicellular, nonmotile desmid?
- 1) Clostridium
  - 2) Chlorobium
  - 3) Cosmarium
  - 4) Chromatium
32. Some of the steps involved in the production of Humulin are given below. Choose the correct sequence.
- i) Synthesis of gene (DNA) for human insulin artificially.
  - ii) Culturing recombinant *E.coli* in bioreactors.
  - iii) Purification of humulin.
  - iv) Insertion of human insulin gene into plasmid.
  - v) Introduction of recombinant plasmid into *E.coli*.
  - vi) Extraction of recombinant gene product from *E.coli*.
- 1) i, iii, v, vi, ii, iv
  - 2) ii, i, iv, iii, v, vi
  - 3) iii, v, ii, i, vi, iv
  - 4) i, iv, v, ii, vi, iii
33. Cockroaches can climb smooth or steep surfaces due to the presence of adhesive pads found on the torsos of their legs. They are called .....
- 1) Tibia
  - 2) Plantulae
  - 3) Arolium
  - 4) Pretarsus
34. Gastrula has a pore which is known as .....
- 1) Gonophore
  - 2) Blastopore
  - 3) Oospore
  - 4) Zoospore
35. The diagram of *Labeo rohita* is given below. Identify the parts labelled A, B, C, D, E, F, G.



- 1) A = Nostril, B = eye, C = Anal fin, D = Caudal fin, E = Dorsal fin, F = Pectoral fin, G = Pelvic fin
- 2) A = Nostril, B = eye, C = Dorsal fin, D = Anal fin, E = Caudal fin, F = Pectoral fin, G = Pelvic fin
- 3) A = Nostril, B = eye, C = Dorsal fin, D = Caudal fin, E = Pectoral fin, F = Anal fin, G = Pelvic fin
- 4) A = Nostril, B = eye, C = Dorsal fin, D = Caudal fin, E = Anal fin, F = Pelvic fin, G = Pectoral fin

(Space for Rough Work)

36. Compare the statements A and B.

**Statement A :** To counteract the increase in turgour pressure in plant cells, the cell wall produces an equal and opposite pressure, i.e., wall pressure.

**Statement B :** When plant cells undergo endosmosis, they swell but do not burst.

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

37. When red blood corpuscles containing both A and B antigens are mixed with your blood serum, they agglutinate. Hence your blood group is ..... type.

- 1) O
- 2) AB
- 3) B
- 4) A

38. Bovine spongiform encephalopathy is a disease caused by prions in a .....

- 1) cow
- 2) sheep
- 3) man
- 4) potato

39. Compare the statements A and B.

**Statement A :** When the urine moves through the descending limb, it becomes hypertonic and as it passes through the ascending limb of Henle's loop, it becomes hypotonic.

**Statement B :** The descending limb is permeable to sodium ions, while the ascending limb is impermeable to sodium ions.

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

40. To meet the demands of the society, *in vitro* production of a large number of plantlets in a short duration is practised in floriculture and horticulture industry today. This is called .....

- 1) Soma clonal variation
- 2) Hybridoma technology
- 3) Micropropagation
- 4) Somatic hybridization

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(Space for Rough Work)

41. With reference to enzymes, turnover number means .....
- 1) the number of substrate molecules that a molecule of an enzyme converts into products per second.
  - 2) the number of substrate molecules that a molecule of an enzyme converts into products per hour.
  - 3) the number of substrate molecules that a molecule of an enzyme converts into products per day.
  - 4) the number of substrate molecules that a molecule of an enzyme converts into products per minute.
42. The following diagrams A, B, C, D and E show the different types of arrangement of stamens based on the cohesion of their parts in different plants. Assign the stamens to their respective plants. Choose the correct answer.



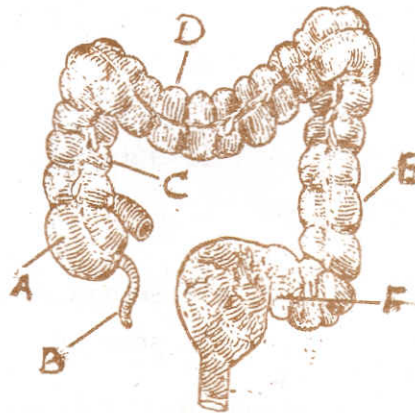
- 1) A = *Hibiscus rosa-sinensis*, B = *Bombax ceiba*, C = *Cucurbita pepo*  
D = *Crotolaria juncea*, E = *Helianthus annus*.
  - 2) A = *Hibiscus rosa-sinensis*, B = *Helianthus annus*, C = *Cucurbita pepo*  
D = *Crotolaria juncea*, E = *Bombax ceiba*.
  - 3) A = *Hibiscus rosa-sinensis*, B = *Crotolaria juncea*, C = *Bombax ceiba*  
D = *Helianthus annus*, E = *Cucurbita pepo*.
  - 4) A = *Hibiscus rosa-sinensis*, B = *Bombax ceiba*, C = *Helianthus annus*  
D = *Cucurbita pepo*, E = *Crotolaria juncea*.
43. The single horned Rhinoceros is protected at .....
- 1) Kaziranga National Park
  - 2) Kahna National Park
  - 3) Rajiv Gandhi National Park
  - 4) Anashi National Park
44. According to Boyle's law, the product of pressure and volume is a constant. Hence,
- 1) if volume of lungs is increased, the pressure also increases proportionately.
  - 2) if volume of lungs is increased, the pressure decreases proportionately.
  - 3) if volume of lungs is increased, the pressure remains the same.
  - 4) if volume of lungs is increased, the pressure decreases disproportionately.
45. According to Darwin, evolution is .....
- 1) a slow, gradual and continuous process.
  - 2) a sudden but discontinuous process.
  - 3) a slow and discontinuous process.
  - 4) a slow, sudden and discontinuous process.

46. *Succus entericus* is secreted by .....
- 1) Brunner's glands
  - 2) Auerbach's plexus
  - 3) Crypts of Lieberkuhn
  - 4) Peyers patches
47. Cell A and cell B are adjacent plant cells. In cell A,  $\psi_s = -20$  bars and  $\psi_p = 8$  bars .  
In cell B,  $\psi_s = -12$  bars and  $\psi_p = 2$  bars . Then,
- 1) there is no movement of water between cell A and cell B.
  - 2) water moves from cell A to cell B.
  - 3) equal amount of water is simultaneously exchanged between cell A and cell B.
  - 4) water moves from cell B to cell A.
48. Populations are said to be sympatric when .....
- 1) two populations are physically isolated by natural barriers.
  - 2) two populations live together and freely interbreed to produce sterile offspring.
  - 3) two populations share the same environment but cannot interbreed.
  - 4) two populations are isolated but occasionally come together to interbreed.
49. In which of the following situations, is there a risk factor for children of incurring *Erythroblastosis foetalis*?
- 1) Mother is Rh -ve and father is Rh+ve
  - 2) Mother is Rh -ve and father is Rh -ve
  - 3) Mother is Rh +ve and father is Rh -ve
  - 4) Mother is Rh +ve and father is Rh +ve
50. Compare the statements A and B.
- Statement A :** RNA produced during transcription in eukaryotic cells cannot be straight away used in photosynthesis.
- Statement B :** RNA splicing phenomena helps in the removal of exons.
- Choose the correct description.
- 1) Both the statements A and B are correct.
  - 2) Both the statements A and B are wrong.
  - 3) Statement A is wrong and B is correct.
  - 4) Statement A is correct and B is wrong.

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(Space for Rough Work)

51. The diagram of large intestine of man is given below. Identify the parts labelled A, B, C, D, E and F.



- 1) A = Caecum, B = Vermiform appendix, C = Sigmoid, D = Ascending colon, E = Transverse colon, F = Descending colon.
  - 2) A = Sigmoid, B = Vermiform appendix, C = Ascending colon, D = Transverse colon, E = Descending colon, F = Caecum.
  - 3) A = Sigmoid, B = Vermiform appendix, C = Descending colon, D = Transverse colon, E = Ascending colon, F = Caecum.
  - 4) A = Caecum, B = Vermiform appendix, C = Ascending colon, D = Transverse colon, E = Descending colon, F = Sigmoid.
52. In genetic fingerprinting, the 'probe' refers to .....
- 1) a radioactively labelled single stranded RNA molecule.
  - 2) a radioactively labelled single stranded DNA molecule.
  - 3) a radioactively labelled double stranded DNA molecule.
  - 4) a radioactively labelled double stranded RNA molecule.
53. Which one of the following is *NOT* a method of soil conservation?
- |                  |                   |
|------------------|-------------------|
| 1) Overgrazing   | 2) Mulching       |
| 3) Crop rotation | 4) Strip cropping |
54. In  $C_4$  pathway, the  $CO_2$  fixation in mesophyll cells is carried out by the enzyme .....
- |                           |                           |
|---------------------------|---------------------------|
| 1) Rubisco                | 2) PEP carboxylase        |
| 3) Pyruvate decarboxylase | 4) Pyruvate dehydrogenase |
55. Which one of the following is a driving force for the process of passive absorption of water in roots?
- 1) Root pressure
  - 2) The increase in imbibitional pressure in root cells.
  - 3) Transpiration in leaves
  - 4) Activity of aquaporins

56. If the systolic pressure is 120 mm Hg and diastolic pressure is 80 mm Hg, the pulse pressure is .....
- 1)  $120 + 80 = 200$  mm Hg                      2)  $120 \times 80 = 9600$  mm Hg
- 3)  $\frac{120}{80} = 1.5$  mm Hg                              4)  $120 - 80 = 40$  mm Hg
57. Tyloses are found in .....
- 1) secondary xylem                                  2) secondary phloem
- 3) sclerenchyma fibres                              4) sclereids
58. Which one of the following synthetic growth regulators is used to promote synchronized flowering in pineapple?
- 1) Phenylmercuric Acetate                      2) Benzyl Aminopurine
- 3) 2-chloroethylphosphonic acid              4) Indolebutyric acid
59. Sporopollenin, a chemical substance is found in .....
- 1) Exine of pollen grain                              2) Intine of pollen grain
- 3) Tapetum of anther                                  4) Endothecium of anther
60. Which one of the following statements about the events of noncyclic photophosphorylation is *NOT* correct?
- 1) ATP and NADPH are not produced.
- 2) Only one photosystem participates.
- 3)  $O_2$  is released.
- 4) Photolysis of water takes place.

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(Space for Rough Work)