

# ENTRANCE EXAMINATION – 2020

## SET – C

Roll No.

Time: 1 Hour 30 Minutes

Signature of Invigilator

Total Marks: 100

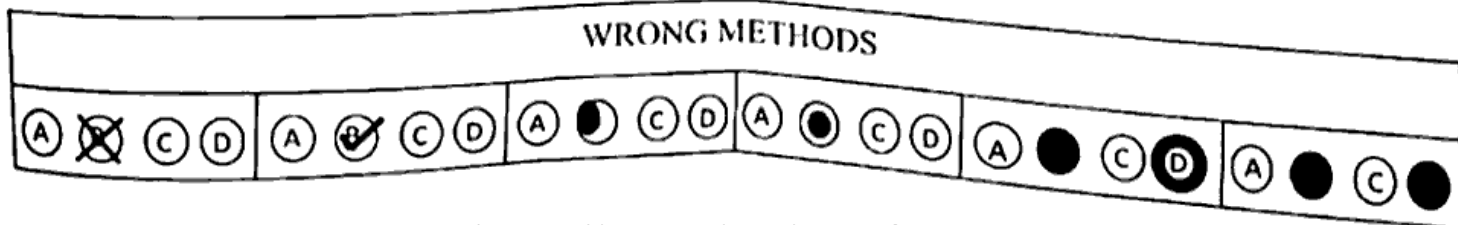
### Instructions to Candidates

1. Do not write your name or put any other mark of identification anywhere in the OMR Answer Sheet. IF ANY MARK OF IDENTIFICATIONS IS DISCOVERED ANYWHERE IN OMR RESPONSE SHEET, the OMR sheet will be cancelled, and will not be evaluated.
2. This Question Booklet contains the cover page and a total of 100 Multiple Choice Questions of One mark each.
3. Space for rough work has been provided at the beginning and end. Available space on each page may also be used for rough work.
4. There is negative marking in Multiple Choice Questions. For each wrong answer, 0.25 marks will be deducted.
5. USE/POSSESSION OF ELECTRONIC GADGETS LIKE MOBILE PHONE, iPhone, iPad, pager ETC. is strictly PROHIBITED.
6. Candidate should check the serial order of questions at the beginning of the test. If any question is found missing in the serial order, it should be immediately brought to the notice of the Invigilator. No pages should be torn out from this question booklet.
7. Answers must be marked in the OMR Response sheet which is provided separately. OMR Response sheet must be handed over to the invigilator before you leave the seat.
8. The OMR Response sheet should not be folded or wrinkled. The folded or wrinkled OMR/Response Sheet will not be evaluated.
9. Write your Roll Number in the appropriate space (above) and on the OMR Response Sheet. Any other details, if asked for, should be written only in the space provided.
10. There are four options to each question marked A, B, C and D. Select one of the most appropriate options and fill up the corresponding oval/circle in the OMR Response Sheet provided to you. The correct procedure for filling up the OMR Answer Sheet is mentioned below.

CORRECT METHOD



WRONG METHODS



1. Genetically Modified (GM) plants have been useful in many ways. Genetic modification has
- A decreased efficiency of mineral usage by plants
  - B Genetically Modified (GM) plants helped to reduce post-harvest losses.
  - C Genetically Modified (GM) plants reduced reliance on chemical pesticides (pest-resistant crops).
  - D Genetically Modified (GM) plants made crops more tolerant to abiotic stresses (cold, drought, salt, heat).
2. In which year, the Air (Prevention and Control of Pollution) Act was amended to include noise as an air pollutant?
- A 1981
  - B 1978
  - C 1987
  - D 1997
3. Which of the following groups has recorded the maximum no. of species?
- A Algae
  - B Fungi
  - C Mammalia
  - D Aves
4. Succession of plants in wet areas is called
- A Hydrarch succession
  - B Xerarch succession
  - C Hydroponic
  - D Hydrophilic succession

5. Who formulated the law of "Competitive Exclusion Principle" to explain the possibility of co-existence of two closely related species?

**Georgy Gause**

B Alfred J. Lotka

C Vito Volterra

**D Richard Goodwin**

6. Which of the following gene codes a toxin protein that controls corn borer?

**A** cryllAb

**u' crylAb**

C. **crylAc**

D cryIIIAbc

7. Who is called as the Darwin of the 20<sup>th</sup> century?

**A Ernst Mayr**

## B Greg Mendel

C H. G. Khorana

**D G. N . Ramachandran**

- (8) What is the biological name of Men?

## A Primate

**.B Homo sapiens**

**C Adam**

**D Hominidae**

9. Which of the following famous botanical garden is located at Lucknow.

**A Royal Botanic Gardens**

National Botanical Research Institute

**C Indian Botanical Garden**

D Botanical Gardens of the Indian Republic

10. Identify the correct order of taxonomical sequences?

- ☒ A Species, Genus, Order, Phylum, Kingdom
- ☐ B Genus, Order, Species, Phylum, Kingdom
- ☐ C Species, Order, Genus, Kingdom, Phylum
- ☐ D Species, Order, Genus, Phylum, Kingdom

11. The HIV genome consists of

- ☐ A Two identical single-stranded DNA molecules that are enclosed with in the core of the virus particle.
- ☒ B Two identical single-stranded RNA molecules that are enclosed with in the core of the virus particle.
- ☐ C One single-stranded RNA molecule that is enclosed within the core of the virus particle.
- ☐ D One single-stranded RNA molecule that is enclosed within the core of the virus particle.

12. Which organism was used for proving the hypothesis of semi-conservative mode of replication of DNA by Matthew Meselson and Franklin Stahl in 1957?

- |   |  |
|---|--|
| <input checked="" type="radio"/> A <i>E. coli</i> | <input type="radio"/> B <i>Oryza sativa</i>      |
| <input type="radio"/> C <i>Mirabilis jalapa</i>   | <input type="radio"/> D <i>Lathyrus odoratus</i> |

13. How many base pairs are there in *E. coli* whose DNA is 1.36 mm in length?

- |  |                                     |
|--|-------------------------------------|
| <input checked="" type="radio"/> A 4000 bp | <input type="radio"/> B 1,36,000 bp |
| <input type="radio"/> C 4,00,000 bp        | <input type="radio"/> D 40,000 bp   |

14. Mendel's experimental material was

A *Mirabilis jalapa*

B *Oryza sativa*

C *Lathyrus odoratus*

D *Pisum sativum*

15. Mendel presented his work in

A Natural History Society in America

B Natural History Society in Germany

C Natural History Society in Brunn

D Natural History Society in Russia

16. The innate tendency of offspring to resemble their parents is called

A Resemblance

B Variation

C Heredity

D Inheritance

17. The reproductive cycle or the menstrual cycle occurs in the female primates of

A Monkeys

B Apes

C Human beings

D All of the above

18. Which of the following is a part of the hind brain

A Cerebellum and medulla

B Cerebrum

C Corpora quadrigemina

D Cerebral aqueduct

19. Which one of the following is not a layer of cranial meninges in brain?

- |   |            |   |           |
|---|------------|---|-----------|
| A | Dura mater | B | Pia mater |
|   | Meningitis | D | Arachnoid |

20. The no. of bones in human cranium is

- |   |     |   |    |
|---|-----|---|----|
| A | 14  | B | 8  |
| C | 206 | D | 33 |

21. Proteins involved in muscle contraction are

- A** Opsin and rhodopsin
- B** Haemoglobin and myoglobin
- C** Carbonic anhydrase and glucose oxidase
- D** Actin and myosin

**22. How many chromosomes are there in a fruit fly?**

- |   |    |   |    |
|---|----|---|----|
| A | 8  | B | 46 |
| C | 23 | D | 42 |

23. Which one of the following is a steroid hormone?

- |              |          |              |             |
|--------------|----------|--------------|-------------|
| <del>A</del> | Insulin  | <del>B</del> | Epinephrine |
| C            | Cortisol | D            | Glucagon    |

24. What are the two main types of cells present in the Islet of Langerhans?
- ☒ A  $\alpha$ -cells and  $\beta$ -cells ☒ B B cells  
C White blood cells D Red blood cells
25. Melatonin is secreted by
- A Parathyroid gland B Adrenal gland  
C Thyroid gland ☒ D Pineal gland
26. Auxin was first isolated from
- A Sunflower B Bovine serum  
☒ C Lotus root D Human urine
27. Which one of the following statements is incorrect?
- ☒ A Carotenoids is blue in color  
B Xanthophyll is yellow in color  
C Chlorophyll b is yellow green in color  
D Chlorophyll a is bright or blue green in color
28. During photosynthesis, in which part of cell, is sugar synthesised?
- A Stroma B Lysosome  
C Ribosome ☒ D Mitochondria

29. Older dying leaves export much of their mineral content to younger leaves through a process called remobilisation. Which of the following mineral ion is generally not remobilised.
- ☒ A Potassium                      B Nitrogen  
☐ C Calcium                         D Sulphur
30. During the cell division in apical meristem, the nuclear membrane appears in
- A Cytokinesis                      B Anaphase  
☒ C Telophase                        D Metaphase
31. Which of the following is not the key feature of metaphase during cell division.
- ☒ A Chromosomes are seen to be composed of two chromatids attached together at the centromere.  
B Chromosomes get aligned along metaphase plate through spindle fibres.  
C Chromosomes are moved to spindle equator.  
D Spindle fibres attach to kinetochores of chromosomes.
32. In a polysaccharide, a bond called ..... links the individual monosaccharides.
- A Ionic bond                        B Phosphodiester bond  
☒ C Glycosidic bond                D Peptide bond



33. Major component of plant cell wall is .....
- |   |          |                                       |           |
|---|----------|---------------------------------------|-----------|
| A | DNA      | B                                     | RNA       |
| C | Proteins | <input checked="" type="checkbox"/> D | Cellulose |
34. If the external solution balances the osmotic pressure of the cytoplasm, to be.....
- |   |            |                                       |            |
|---|------------|---------------------------------------|------------|
| A | Exothermic | B                                     | Hypertonic |
| C | Hypotonic  | <input checked="" type="checkbox"/> D | Isotonic   |
35. Which protein is present in membrane and help in transport of molecules and small proteins to pass through the membrane?
- |                                       |             |                                       |          |
|---------------------------------------|-------------|---------------------------------------|----------|
| <input checked="" type="checkbox"/> A | Tubulin     | B                                     | Collagen |
| C                                     | Transferrin | <input checked="" type="checkbox"/> D | Porin    |
36. The best bio material for the study of mitosis in laboratory is
- |   |        |                                       |          |
|---|--------|---------------------------------------|----------|
| A | Ovary  | B                                     | Leaf tip |
| C | Anther | <input checked="" type="checkbox"/> D | Root tip |
37. In a somatic cell cycle, DNA synthesis take place in
- |   |                     |                                       |           |
|---|---------------------|---------------------------------------|-----------|
| A | Prophase of mitosis | <input checked="" type="checkbox"/> B | S phase   |
| C | G 2 prophase        | D                                     | G 1 phase |

38. Who discovered triple helical structure of collagen?

~~A~~ James Watson

B Srinivasa Ramanujan

C G. N. Ramachandran

D H. G. Khorana

39. Ureotelic animal excretes

~~A~~ Urea

B Uric acid

C Ammonia

D Nitrogen

40. Which one of the following is incorrect for an isobilateral leaf?

~~A~~ Reticulate Venation

B Parallel venation

C The mesophyll is not differentiated into palisade and spongy

D The stomata are present on both the surfaces of the epidermis

41. A staminode is

A A fertile stamen

B A sterile carpel

C A staminal tube with ovules

D A sterile stamen

42. The most notable disease caused by prions is

~~A~~ Bovine spongiform encephalopathy (BSE)

B Parkinson's disease

C Alzheimer's disease

D Meningitis

43. Identify the incorrect habitat of archaeobacteria.

- ☒ A Saliva
- ☐ B Marshy areas
- ☒ C Hot springs
- ☐ D Extreme salty areas

44. Which of the following is correct as per the Five Kingdom Classification proposed by R. H. Whittaker in 1969.

- ☒ A Monera, Protista, Fungi, Plantae and Animalia.
- ☐ B Prokaryotica, Protista, Fungi, Plan tae and Animalia.
- ☐ C Prokaryotica, Fungi, Plantae, Animalia and Eukaryotica
- ☐ D Algac, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms

45. Which of the following is the smallest living cell that can survive without oxygen.

- ☐ A E. coli
- ☒ B Mycoplasma
- ☐ C HIV
- ☐ D Corona virus

46. Which one of the following is not an example of class Aves?

- ☐ A Pavo
- ☐ B Camelus
- ☐ C Columba
- ☐ D Corvus

47. The Anatomy of Seed Plants was written by

- ☒ A Katherine Esau
- ☐ B Marx Albert
- ☐ C Lewin Gene
- ☐ D Albert Lehninger

48. Chlorophyll d is present in

☒ A Rhodophyceae.

B Phaeophyceae

C Fucoxanthin

D Chlorophyceae

49. Carrageen is a

A Fungi

C Brown algae

B Virus

☒ D Red algae

50) Bohr's orbitals are called stationary because

☒ A Electrons in Bohr's orbitals are stationary

B The protons remain in nuclei and are stationary.

C The electrons in Bohr's orbitals have fixed energy.

D Bohr's orbitals have a fixed radii

51.  $\text{BF}_3$  acts as an acid according to a concept of

☒ A Bronsted

B Arrhenius

C Lewis

D Michaelis and Ment

52. The isomers which can be converted into another form by rotation of molecule around single bond are called

☒ A Geometrical isomers

B Enantiomers

C Diastereomers

D Conformers

53. In an aqueous solution, hydrogen will not reduce

A  $\text{Fe}^{3+}$

B  $\text{Cu}^{2+}$

C  $\text{Ag}^+$

D  $\text{Zn}^{2+}$

54. Dehydration of alcohol is an example of

A Addition reaction

☒ B

Substitution reaction

C Redox reaction

D

Elimination reaction

55. Which of the following has least polarity in bond ?

☒ A H-S

B H-O

C H-Cl

D H-F

56. Tyndall is effect that can be observed in

A Precipitate

B

Unsaturated solute

C Good solvent

☒ D

Colloidal solution

57. If gas is expanded at constant temperature

A The number of molecules of gas increases

B The kinetic energy of the molecules decreases

C The kinetic energy of the molecules remains the same

☒ D the pressure increases

58. The process of separation of a racemic mixture into d- and l-enantiomers is called

- A Dehydrohalogenation      B Revolution  
C Dehydration      ☒ D Resolution

59. How many chain isomers could be obtained from the  $C_6H_{14}$ ?

- A 4      B 5  
C 6      ☒ D 7

60. The molar concentration of 20 gram of NaOH present in 5 litre of solution is

- A 1.0 moles/litre      B 0.5 moles/litre  
C 0.2 moles/litre      ☒ D 0.1 moles/litre

61. One of the following molecules is not a polymer

- ☒ A Cellulose      B Protein  
C DNA      D Amino acid

62. Electrons in the outer orbit are called

- A Orbitals      ☒ B Valences  
C Shells      D Nuclei

63. Tree of 21<sup>st</sup> Century is

A Rubber

☒ B Neem

C Mango

☒ D Acacia

64. Most stable ecosystem is

A Ocean

B Mountain

C Desert

☒ D Forest

65. The pH of a solution is determined by

A concentration of salt

B dielectric constant of the medium

☒ C relative concentration of acids and bases

D environmental effect

66. One nanometre is equal to

☒ A  $10^{-6}$  mm

B  $10^{-6}$  m

C  $10^9$  m

☒ D  $10^{-9}$  mm

67. When a planet comes nearer to sun, it moves

A Standstill

☒ B Constant at every point

C Slower

☒ D Faster

68. In p-type semiconductor germanium is doped with

A Aluminium

B Gallium

C Boron

☒ D All of the above





74. Water falls from a height of 500 m. The rise in temperature at bottom if whole of the energy remains in water, will be  
(Specific heat of water = 4.2 kJ/Kg)

A 1.02 °C  
C 1.16 °C  
B 0.96 °C  
D 0.23 °C

75. The SI unit of power is

A Joule  
C Ohm

B Ampere  
D Watt

76. The value of 'g' at a particular point is 9.8 m/sec<sup>2</sup> suppose the earth suddenly shrink uniformly to half its present size without losing any mass. The value of 'g' at the same point (assuming that the distance of the point from the centre of the earth does not shrink) will become

A 9.8 m/s<sup>2</sup>  
C 4.9 m/s<sup>2</sup>

B 19.6 m/s<sup>2</sup>  
D 9.8 m/s<sup>2</sup>

77. A point object is 24 cm above the surface of water ( $n = \frac{4}{3}$ ) in lake. A fish inside the water will observe the image to be at a point.

A 18 cm below the surface of water  
B 32 cm above the surface of water  
C 6 cm below the surface of water  
D 32 cm below the surface of water

78. Sticky ends are overhanging pieces of single stranded

A DNA

☒ B RNA

C Proteins

☒ D Messenger RNA

79. Which of the following viral vectors has the largest capacity for foreign DNA with respect to gene transfer to animal cells? <https://www.jamiastudy.com>

A Adenovirus.

☒ B Retrovirus

C Baculovirus

D Corona Virus

80. The term Single Cell Protein (SCP) was coined by

A Ian Wilmot

B Louis Pasteur.

C Gregor Mendel

☒ D Carroll L. Wilson

81. Which one of the following statement about Angiotensin II is incorrect?

A Angiotensin II is a powerful vasodilator.

B Angiotensin II activates the adrenal cortex to release Aldosterone.

☒ C Angiotensin II increases the glomerular blood pressure and thereby GFR

D Angiotensin II is powerful vasoconstrictor.

82. Ammonotelism is

A The process of excreting uric acid

B The process of excreting urea and uric acid

C The process of excreting urea

☒ D The process of excreting ammonia

83. Who discovered blood groups?
- |   |                 |
|---|-----------------|
| A Ernst Haeckel                                     | B Camillo Golgi |
| <input checked="" type="radio"/> C Karl Landsteiner | D Thomas Cooley |
84. What is the normal platelet count in  $1 \text{ mm}^3$  of blood?
- |                     |                 |
|---------------------|-----------------|
| A 1,50,000-3,50,000 | B 1-8           |
| C 1,500-3,000       | D 10,000-80,000 |
85. Which is the most abundant protein in the whole of the biosphere?
- |   |   |
|---|---|
| A Collagen                                    | B Ribulosebisphosphate Carboxy lase-Oxygenase (RuBisCO) |
| <input checked="" type="radio"/> C Hemoglobin |   |
| D Serum albumin                               |   |
86. Which of the following is not correct?
- |   |  |
|---|--|
| <input checked="" type="radio"/> A Robert Brown discovered the cell.    |  |
| B A unicellular organism carries out its life activities within a cell. |  |
| C Virchow explained that cells are formed from pre-existing cells.      |  |
| D Schleiden and Schwann formulated the cell theory.                     |  |
87. Which type of chromosome has centromere slightly away from the middle of the chromosome resulting into one shorter arm and one longer arm?
- |                              |   |
|------------------------------|---|
| A Telocentric chromosome     | <input checked="" type="radio"/> B Acrocentric chromosome |
| C Sub-metacentric chromosome | D Metacentric chromosome                                  |

88. Which of the following statement is correct for ribosome.
- A Ribosome have only cell membrane, not cell wall
  - B Ribosomes are found in nucleus of a cell.
  - C Ribosome is found only i n animal cell.
  - ☒ D Ribosome is a non-membrane bound organelles found in a cell.

89. Who discovered Viroids?

- |                            |   |
|----------------------------|---|
| A Ananda Mohan Chakraborty | B Charles Darwin                                  |
| C Kari Mulis               | <input checked="" type="checkbox"/> D T.O. Diener |

90. Chipko movement started to conserve

- |              |   |
|--------------|---|
| A Grasslands | <input checked="" type="checkbox"/> B Forests |
| C Deserts    | D Soil  |

91. Which of the following will easily dissolve in a polar solvent?

- |   |           |
|---|-----------|
| <input checked="" type="checkbox"/> A Sodium chloride | B Argon   |
| C Methane   | D Benzene |

92. The dissociation constant of  $H_2O$  at  $25^\circ C$  is

- |   |                |
|---|----------------|
| A $10^7 M$  | B $10^{-7} M$  |
| <input checked="" type="checkbox"/> C $10^{14} M$ | D $10^{-14} M$ |

93. Absorption maxima of DNA is around

A 260 nm

B 280 nm

C 409 nm

D 180 nm

94. Which of the following alcohols would be most soluble in water?

A Octanol

B Butanol

☒ C Ethanol

D Methanol

95. The resistance of a wire varies inversely as

A Length

B Temperature

C Resistivity

☒ D Area of cross section

96. Voltage is a kind of

A Solar energy

B Fuel energy

C Kinetic energy

D Potential energy

97. The velocity of an electron in the innermost orbit of an atom is

A 0

B Average of all

☒ C Lowest

D Highest

98. If the momentum of a particle is doubled, then its de-Broglie wave length will become

☒ A Unchanged

B 4 Times

C 2 Times

D  $\frac{1}{2}$  Times

99. When ultraviolet radiation is incident on a surface, no photoelectrons are emitted. If a second beam causes photoelectrons to be ejected, it may consist of
- |               |                      |
|---------------|----------------------|
| A Radio waves | B Visible light rays |
| C X-rays      | D Infra-red waves    |
100. 16 gram of oxygen at  $37^{\circ}\text{C}$  is mixed with 14 gram of nitrogen at  $27^{\circ}\text{C}$ , the temperature of the mixture is
- |                          |                          |
|--------------------------|--------------------------|
| A $32.0^{\circ}\text{C}$ | B $27.0^{\circ}\text{C}$ |
| C $37.0^{\circ}\text{C}$ | D $30.5^{\circ}\text{C}$ |

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