# Entrance Examination for Admission to the P.G. Courses in the Teaching Departments, 2021

## CSS

## COMPUTATIONAL BIOLOGY SPECIALIZATION IN NGS AND CADD

### General Instructions

1. The Question Paper is having two Parts — Part 'A' Objective type (60%) & Part 'B' Descriptive type (40%).

2. Objective type questions which carry 1 mark each are to be (✓) 'tick marked' in the response sheets against the appropriate answers provided.

3. 4 questions are to be answered out of 10 questions carrying 10 marks each in Part 'B'.

4. **Negative marking** : 0.25 marks will be deducted for each wrong answer in Part 'A'.

**Time : 2 Hours**                                                              **Max. Marks : 100**

| To be filled in by the Candidate | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Register Number | in Figures | | | | | | | | | |
| | in words | | | | | | | | | |

## PART – A

### (Objective Type)

Choose appropriate answer from the options in the questions.

**(60 × 1 = 60 marks)**

1. Happiness is related to Sorrow in the same way as Comfort is related to

   a) Hardship                        b) Rest

   c) Poverty                          d) Difficulty

_____

2. NFK : PHM :: AXH :?

   a) BYI         b) ZWG         c) CZJ         d) DAK

3. Choose the missing term out of the given alternatives.

   BD       GI       LN       QS       ——————

   a) TV                       b) VW

   c) WX                     d) VX

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4. Choose the correct alternative.

      -bc--bb-aabc

   a) acac

   b) babc

   c) ab

   d) none of the above

5. If ROSE is coded as 6821, CHAIR is coded as 73456 and PREACH is coded as 961473, what will be the code for SEARCH?

   a) 246173

   b) 214673

   c) 214763

   d) 216473

6. In a certain code language *pit nae tom means apple is green; nae ho tap* means *green and white* and *ho tom ka* means *shirt is white*. Which of the following represents *apple* in that language?

   a) nae

   b) tom

   c) pit

   d) ho

7. In a certain code language TSSNOFFQ is written as STRONGER then GQFDENN will be written as

   a) DOMEERF

   b) FEEDORM

   c) FREEDOM

   d) FREEDMO

8. A man walks 10 km towards north. From there he walks 6 km towards south. Then he walks 3 km towards east. How far in which direction is he with reference to his starting point?

   a) 7 km east

   b) 5 km west

   c) 5 km north-east

   d) 7 km west

9. Five students A,B,C,D and E are sitting in a row, D is on the right of E. B is on the left of E but is on the right of A. D is on the left of C. Who is sitting on the extreme left?

   a) A          b) B          c) C          d) D

10. M denotes ×, D denotes ÷, A denotes +, S denotes – Then 25S72D12A1M6

    a)   25                                   b)   20

    c)   35                                   d)   2

11. Radha ranks twenty first from the top and twentieth from the bottom in a certain examination. How many students are there in the class?

    a)   41                                   b)   40

    c)   42                                   d)   45

12. Introducing a girl, Vinay said, 'she is my maternal grandfather's only grandson's wife'. How is Vinay related to that girl?

    a)   Father-in-law                        b)   Brother-in-law

    c)   Husband                              d)   Father

13. $20 – [9 – \{7 + (2 \times 3)\} + 5] = ?$

    a)   20              b)   15              c)   17              d)   19

14. The sum of squares of two numbers is 80 and the square of their difference is 36. The product of the two numbers is

    a)   22                                   b)   44

    c)   58                                   d)   116

15. In an examination, 42% students failed in History and 52% failed in Geography. If 17% students failed in both subjects, find the percentage of those students who passed in both the subjects.

    a)   25                                   b)   27

    c)   23                                   d)   22

16. Ramesh alone does a piece of work in 4 days and Suresh does it in 12 days. In how many days will the two do it together?

    a)   3 days                               b)   1½ days

    c)   4 days                               d)   8 days

17. Two pipes can fill a tank in 9 hours and 12 hours respectively. In how much time will they fill the tank when opened together?

a) 3½ hours  
b) 5²⁄₇ hours  

c) 5 hours  
d) 4½ hours  

18. A is as much younger than B as he is older than C. If the sum of B's and C's ages is 40 years. Find the age of A.

a) 40 years  
b) 10 years  

c) 25 years  
d) 20 years  

19. Manoj would have walked 40 km more if he walks at this speed of 14 kmph instead of 10 kmph. How much distance has he covered now?

a) 60 km  
b) 90 km  

c) 100 km  
d) 110 km  

20. If a train crosses a platform in 9 seconds at a speed of 50 kmph, then what is the length of the platform?

a) 125 m  
b) 160 m  

c) 100 m  
d) 110 m  

21. Find the value of 800 ÷100/4 ÷ 0.2

a) 320  
b) 160  

c) 180  
d) 220  

22. Six persons A, B, C, D, E and F are standing in a circle. B is between F and C, A is between E and D, F is to the left of D. Who is between A and F?

a) B  
b) C  

c) D  
d) E  

23. If '367' means 'I am happy'; '748' means 'You are sad' and '469' means 'Happy and Sad' in a given code, then which of the following represent 'and' in that code?

a) 3  
b) 6  

c) 9  
d) 4

24. A hall is 15 m long and 12 m broad. If the sum of the areas of the floor and ceiling is equal to the sum of the areas of four walls, the volume of the hall is:

a) 720 m$^3$  
b) 900 m$^3$  
c) 1200 m$^3$  
d) 1800 m$^3$

25. Evaluate 28% of 450 + 45% of 280

a) 232  
b) 242  
c) 252  
d) 262

26. There is a tree between houses of A and B. If the tree leans on A's House, the tree top rests on his window which is 12 m from ground. If the tree leans on B's House, the tree top rests on his window which is 9 m from ground. If the height of the tree is 15 m, what is distance between A's and B's house?

a) 21 m  
b) 25 m  
c) 16 m  
d) 12 m

27. The ratio of the present age of father to that of son is 7:2. After 10 years their ages will be in the ratio of 9:4. The present ages of the father is

a) 35 years  
b) 40 years  
c) 30 years  
d) 25 years

28. In a room there are 2 green chairs, 3 yellow chairs and 4 blue chairs. In how many ways can Raj choose 3 chairs so that at least one yellow chair is included?

a) 3  
b) 30  
c) 64  
d) 84

29. What is the probability of getting a sum 9 from two throws of a dice?

a) 1/6  
b) 1/8  
c) 1/9  
d) 1/12

30. The probability that a card drawn from a pack of 52 cards will be a diamond or a king is

a) 2/13  
b) 4/13  
c) 1/13  
d) 1/52

31. The cell organelle associated with intracellular digestion of macromolecules is

a) Lysosome b) Polysome

c) Peroxisome d) Dictyosome

32. In chloroplasts, chlorophyll is present in the

a) Stroma

b) Outer membrane

c) Thylakoids

d) Inner membrane

33. The expulsion of materials form the cell by cell vomiting is called

a) Endocytosis b) Pinocytosis

c) Phagocytosis d) Exocytosis

34. The study of nucleus is called

a) Histology b) Cytology

c) Karyology d) Microbiology

35. During Meiosis

a) Nucleus splits twice

b) Cytokinesis occurs twice

c) Chromosome splits once

d) a and c are more correct

36. A polymer of fructose is

a) Cellulose b) Starch

c) Glycogen d) Inulin

37. The protein part of enzyme is

a) Apo enzyme b) Co-enzyme

c) Prosthetic group d) Holoenzyme

38. Which of the following is a water soluble vitamin?

    a)  Vitamin A                          b)  Vitamin D

    c)  Vitamin E                          d)  Vitamin B

39. Sugar present in DNA is

    a)  Hexose                             b)  Heptose

    c)  Pentose                            d)  Tetrose

40. Energy currency of cell

    a)  ADP                                b)  ATP

    c)  NADP                               d)  Mitochondria

41. Which of the following does not take part in gene expression?

    a)  Replication                        b)  Transcription

    c)  RNA processing                     d)  Translation

42. Which is the most commonly used start codon?

    a)  UAA          b)  AUG          c)  UAG          d)  UGA

43. The process by which RNA molecules are initiated, elongated and terminated

    a)  Central Dogma                      b)  Translation

    c)  Transcription                      d)  Replication

44. Human Genome Project gave a new area in Biology called as

    a)  Bioinformatics                     b)  Biosciences

    c)  Biochemistry                       d)  Biological Sciences

45. The term Genomics was coined by

    a)  Thomas Cech                        b)  T.H. Morgan

    c)  Thomas Roder                       d)  Craig Venter

46. Which of the following antimicrobial drugs is synthetic?
    a) Sulfanilamide
    b) Penicillin
    c) Actinomycin
    d) Neomycin

47. First protein sequenced by Frederick Sanger is
    a) Myoglobin
    b) Myosin
    c) Insulin
    d) Haemoglobin

48. Sucrose is a
    a) Monosaccharide
    b) Disaccharide
    c) Polysaccharide
    d) Triose

49. Almost all the plasma proteins of humans are glycoproteins, except.
    a) Albumin
    b) Fibrinogen
    c) Thrombin
    d) Haemoglobin

50. A gene is essentially a:
    a) Sequence of many codons in a DNA molecule
    b) Single codon in a DNA molecule
    c) Chromosome
    d) None of the above

51. Which one of the following is not a search engine?
    a) Bing
    b) Google
    c) Yahoo
    d) Windows

52. World Wide Web
    a) is another name for internet
    b) worldwide connection for computers
    c) a collection of linked information residing on computers connected by the internet
    d) a collection of worldwide information

53. Which protocol use to transmit information on the World Wide Web
    a) HTPP
    b) HPPT
    c) HTTTP
    d) HTTP

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54. Which of the following is incorrect? Algorithms can be represented?

    a)   as pseudo codes             b)   as syntax

    c)   as programs                d)   as flowcharts

55. A collection of interrelated records is called a

    a)   Database

    b)   Spreadsheet

    c)   Management information system

    d)   Text file

56. Which of the following OS is not based on Linux?

    a)   Ubuntu                 b)   Redhat

    c)   CentOs                 d)   BSD

57. A Compiler is ——————.

    a)   A combination of computer hardware

    b)   A program which translates one high level language to another

    c)   A program which translates one high level language to a machine language

    d)   None of the above

58. FTP stands for

    a)   File Text Protocol

    b)   File Transfer Protocol

    c)   Firm Transfer Protocol

    d)   File Transplant Protocol

59. The Internet was originally a project of which agency?

    a)   ARPA       b)   NSF        c)   NSA       d)   None of these

60. "Don't be evil" was the informal corporate motto of which of the following internet giants?

    a)   Google     b)   Yahoo      c)   Microsoft     d)   Baidu

ANSWER SHEET — PART – A

| 1 | A | B | C | D | E |
| 2 | A | B | C | D | E |
| 3 | A | B | C | D | E |
| 4 | A | B | C | D | E |
| 5 | A | B | C | D | E |
| 6 | A | B | C | D | E |
| 7 | A | B | C | D | E |
| 8 | A | B | C | D | E |
| 9 | A | B | C | D | E |
| 10 | A | B | C | D | E |
| 11 | A | B | C | D | E |
| 12 | A | B | C | D | E |
| 13 | A | B | C | D | E |
| 14 | A | B | C | D | E |
| 15 | A | B | C | D | E |
| 16 | A | B | C | D | E |
| 17 | A | B | C | D | E |
| 18 | A | B | C | D | E |
| 19 | A | B | C | D | E |
| 20 | A | B | C | D | E |

| 21 | A | B | C | D | E |
| 22 | A | B | C | D | E |
| 23 | A | B | C | D | E |
| 24 | A | B | C | D | E |
| 25 | A | B | C | D | E |
| 26 | A | B | C | D | E |
| 27 | A | B | C | D | E |
| 28 | A | B | C | D | E |
| 29 | A | B | C | D | E |
| 30 | A | B | C | D | E |
| 31 | A | B | C | D | E |
| 32 | A | B | C | D | E |
| 33 | A | B | C | D | E |
| 34 | A | B | C | D | E |
| 35 | A | B | C | D | E |
| 36 | A | B | C | D | E |
| 37 | A | B | C | D | E |
| 38 | A | B | C | D | E |
| 39 | A | B | C | D | E |
| 40 | A | B | C | D | E |

| 41 | A | B | C | D | E |
| 42 | A | B | C | D | E |
| 43 | A | B | C | D | E |
| 44 | A | B | C | D | E |
| 45 | A | B | C | D | E |
| 46 | A | B | C | D | E |
| 47 | A | B | C | D | E |
| 48 | A | B | C | D | E |
| 49 | A | B | C | D | E |
| 50 | A | B | C | D | E |
| 51 | A | B | C | D | E |
| 52 | A | B | C | D | E |
| 53 | A | B | C | D | E |
| 54 | A | B | C | D | E |
| 55 | A | B | C | D | E |
| 56 | A | B | C | D | E |
| 57 | A | B | C | D | E |
| 58 | A | B | C | D | E |
| 59 | A | B | C | D | E |
| 60 | A | B | C | D | E |

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# COMPUTATIONAL BIOLOGY SPECIALIZATION IN NGS AND CADD

## PART – B
### (Descriptive Type)

Answer **any four** questions. Each question carries **10** marks.  **(4 × 10 = 40 Marks)**

1. Differentiate between mitosis and meiosis.

2. Give the classification and functions of vitamins.

3. Discuss the application of Information Technology in Biology.

4. Comment on initiation, elongation and termination events in prokaryotic DNA replication.

5. Explain the function of tRNA, mRNA and rRNA.

6. Give an account of structure of protein.

7. Delineate about carbohydrates. Classify them with suitable examples.

8. Explain the following: Ethernet, IP address, Compilers interpreters.

9. Briefly explain about databases.

10. Describe about WWW, Search engines and Intranet.

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