

# **Prelims Biotechnology**

**Answer Key**

**26/06/2021**



# Gujarat Biotechnology Research Centre

Prelims ( Scientist B)

This question booklet contains 16 pages

Application No: \_\_\_\_\_

Time: 1 Hours

Total Marks: 100

Total Questions: 100

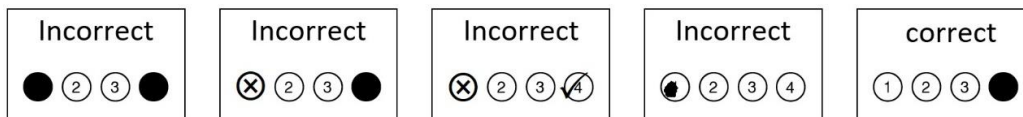
Candidate Signature : .....

Invigilator Signature : .....

## Instructions for Candidate

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1. This question booklet contains 100 questions.
2. Each correct answer carries 1 mark.
3. Use only Black Ball Point Pen to darken the appropriate circle in OMR.
4. Please darken the complete circle.
5. Darken ONLY ONE CIRCLE for each Question as shown below:



6. Answer once marked cannot be changed.
7. Please do not make any stray marks on the Question Booklet.
8. Rough works must be done on the blank page of Question Booklet.
9. Mark your answer in the appropriate space in the Answer Sheet against the Number corresponding to the question.
10. The Candidate is NOT allowed to carry Question booklet and OMR response sheet with him/her on conclusion of examination.



- 1 When the amino acid alanine (R-group is CH<sub>3</sub>) is added to a solution with a pH of 7.3, alanine becomes
  - (A) a cation
  - (B) nonpolar
  - (C) a zwitterions
  - (D) an isotope
  
- 2 The isoelectric point of an amino acid is defined as the pH
  - (A) where the molecule carries no electric charge
  - (B) where the carboxyl group is uncharged
  - (C) where the amino group is uncharged
  - (D) of maximum electrolytic mobility
  
- 3 The model that is now known to be correct for the structure of biological membrane is
  - (A) fluid mosaic model
  - (B) page's model
  - (C) lac operon model
  - (D) lock and Key model
  
- 4 Which of the following is a purine?
  - (A) cytosine
  - (B) adenine
  - (C) thymine
  - (D) uracil
  
- 5 A deficiency of thiamin produces the disease known as
  - (A) beri-beri
  - (B) scurvy
  - (C) cataract
  - (D) anemia
  
- 6 Acyl carrier protein (ACP) plays an important role in the biosynthesis of
  - (A) fatty acids
  - (B) amino acids
  - (C) sugars
  - (D) carbohydrates
  
- 7 Which of these hormones is a catecholamine?
  - (A) follitropin
  - (B) norepinephrine
  - (C) tetraiodothyronine
  - (D) tetrahydrofolate
  
- 8 Who among the following coined the term Biotechnology?
  - (A) Karl Ereky
  - (B) Paul Terasaky
  - (C) Janes Clarke
  - (D) Clarke and Somner

- 9 Accumulation of lactate leads to  
(A) increase in pH  
(B) no change in pH  
(C) reduction in the pH of culture hence loss of cell viability  
(D) no loss of cell viability
- 10 The hybrid embryo can be rescued from damage/collapse by growing it  
(A) at low temperature  
(B) at low pH  
(C) at low water activity  
(D) in an artificial medium
- 11 Plant tissue culture technique is used to select somaclones that are  
(A) resistant to herbicide  
(B) not resistant to herbicide  
(C) resistant to insecticides  
(D) not resistant to insecticides
- 12 The average stroke volume i.e. the blood pumped by heart in one stroke is approximately  
(A) 7 mL  
(B) 70 mL  
(C) 700 mL  
(D) 7000 mL
- 13 Which of these statements is FALSE about lipids?  
(A) they are water insoluble  
(B) an integral part of the cell membrane  
(C) they are polymers  
(D) store energy
- 14 A buffer solution at pH 10 has a ratio of  $[A^-]/[HA]$  of 10. What is the pKa of the acid?  
(A) 8  
(B) 9  
(C) 10  
(D) 11
- 15 Which of these is not an essential feature of plasmid vectors used for cloning only?  
(A) origin of replication  
(B) multiple cloning site  
(C) ampicillin resistant gene  
(D) promoter region
- 16 The action of DNA topoisomerases ultimately help in preventing which of the following?  
(A) polyadenylation of mRNA  
(B) formation of spliceosomal assembly  
(C) DNA tangling during replication  
(D) alternative splicing

- 17 What property of retroviruses makes them especially useful in gene therapy?
- (A) retroviruses use reverse transcriptase to convert their DNA to RNA
  - (B) retroviruses have complex envelopes
  - (C) retroviruses have single-stranded RNA.
  - (D) retroviruses insert themselves permanently in a genome
- 18 Blood is transported to capillaries in the myocardium by:
- (A) pulmonary arteries
  - (B) coronary sinus
  - (C) superior vena cava
  - (D) coronary arteries
- 19 Cause of a disease is best studied using:
- (A) pathogenesis
  - (B) prognosis
  - (C) etiology
  - (D) parasitism
- 20 Which type of glial cell is responsible for glucose uptake from blood?
- (A) ependyma
  - (B) oligodendrocytes
  - (C) microglia
  - (D) astrocytes
- 21 The following does not happen in a cholera infection:
- (A) dehydration and kidney failure
  - (B) prevalence of toxin in the digestive system
  - (C) blockage of pancreatic function
  - (D) severe rice water like diarrhoea
- 22 The following is not an ectoparasite:
- (A) ticks
  - (B) bed bugs
  - (C) lice
  - (D) protozoa
- 23 First cellular organism to be completely genome sequenced.
- (A) escherichia coli
  - (B) haemophilus influenzae
  - (C) drosophila melanogaster
  - (D) homo sapiens
- 24 Which of the following is not a mutation detection technique?
- (A) RFLP
  - (B) SSCP
  - (C) STR
  - (D) sequencing

- 25 Organisms that ferment glucose do not produce following as an end product.
- (A) lactic acid
  - (B) propionic acid
  - (C) alcohol
  - (D) oxygen
- 26 A map of chromosomes that utilizes cloned and sequenced DNA fragments is known as
- (A) physical map
  - (B) genetic map
  - (C) cloning map
  - (D) genome map
- 27 A person, whose individual genome was sequenced for the first time in history of genome sequencing projects
- (A) Francis crick
  - (B) Craig venter
  - (C) James watson
  - (D) Kary Mullis
- 28 Which of the following is the protein database?
- (A) NCBI
  - (B) KREGG
  - (C) pfam
  - (D) MEGAN
- 29 Expression of transgene in target tissue is determined by
- (A) enhancer
  - (B) promotor
  - (C) silencer
  - (D) reporter
- 30 The CRISPR--Cas9 system is a/an \_\_\_\_\_ mechanism in bacteria
- (A) digestive
  - (B) immune
  - (C) reproductive
  - (D) respiratory
- 31 Epigenetic mechanism includes
- (A) DNA Methylation
  - (B) protein denaturation
  - (C) RNA degradation
  - (D) DNA editing
- 32 The first therapeutic product formed by means of recombinant DNA technology is
- (A) human growth hormone
  - (B) insulin
  - (C) hepatitis B vaccine
  - (D) rabies vaccine

- 33 How many host cells are required to produce a single dose of polio vaccine
- (A)  $2 \times 10^4$
  - (B)  $2 \times 10^6$
  - (C)  $2 \times 10^8$
  - (D)  $2 \times 10^9$
- 34 Programmed cell death is known as
- (A) necrosis
  - (B) decay
  - (C) apoptosis
  - (D) nephritis
- 35 Probiotics are
- (A) cancer inducing microbes
  - (B) safe antibiotics
  - (C) new kind of food allergens
  - (D) live microbial food supplement
- 36 The recombination frequency is minimum in \_\_\_\_\_
- (A) RILs
  - (B) doubled haploid
  - (C) MAGIC
  - (D) AIL
- 37 Which of the following is used to communicate with an RDBMS?
- (A) R
  - (B) S
  - (C) SQL
  - (D) Java
- 38 How many types of antibodies are there?
- (A) five
  - (B) three
  - (C) two
  - (D) four
- 39 Which of the following immunity is called the first line of defence?
- (A) innate Immunity
  - (B) active immunity
  - (C) passive immunity
  - (D) acquired immunity
- 40 Who coined the term Bioinformatics and when?
- (A) Paulien Hogeweg, 1979
  - (B) Dr Margaret Oakley Dayhoff, 1976
  - (C) Robert Ledley, 1978
  - (D) David W Mount, 1977

- 41 The identification of drugs through the genomic study is called\_\_\_\_\_.
- (A) genomics
  - (B) pharmacogenomics
  - (C) pharmacogenetics
  - (D) cheminformatics
- 42 Which of the following operating system is almost coded in C?
- (A) Windows
  - (B) Mac
  - (C) Linux
  - (D) Sun-Solaris
- 43 The first plant genome sequence done in India is\_\_\_\_\_
- (A) Pigeon pea
  - (B) Bajara
  - (C) Tomato
  - (D) Brinjal
- 44 In fish, population studies indicates–
- (A) survival rate
  - (B) mortality rate
  - (C) growth rate
  - (D) recruitment
- 45 Maximum solubility of oxygen in clean water bodies is
- (A) 7.4 mg/l
  - (B) 14.7 mg/l
  - (C) 10 mg/l
  - (D) 7.4%
- 46 The largest living thing on Earth is
- (A) tremella fuciformis
  - (B) armillaria ostoyae
  - (C) agaricus bisporus
  - (D) volvariella volvacea
- 47 How many DNA duplex is obtained from one DNA duplex after 4 cycles of PCR?
- (A) 4
  - (B) 8
  - (C) 16
  - (D) 32
- 48 The primitive prokaryotes responsible for the production of biogas from the dung of ruminant animals, include the
- (A) thermoacidophiles
  - (B) methanogens
  - (C) eubacteria
  - (D) actinomycetes

- 49 All bacteria that inhabit the human body are
- (A) heterotrophs
  - (B) chemolithotrophs
  - (C) autotrophs
  - (D) phototroph
- 50 What is estimated age of the Earth?
- (A) 5.5 billion years
  - (B) 4.5 billion years
  - (C) 3.5 billion years
  - (D) 2.5 billion years
- 51 Which of the following is not a required criteria for bio-indicator organisms
- (A) resistant to the pollutant
  - (B) distributed widely
  - (C) available all year
  - (D) have a high concentration factor for the specific pollutant
- 52 The addition of selected organisms to contaminated sites in order to speed up degradation is referred as
- (A) biomagnification
  - (B) biostimulation
  - (C) bioaugmentation
  - (D) bioaccumulation
- 53 cGMP stands for
- (A) good manufacturing practice
  - (B) good maintenance of pharmaceuticals
  - (C) current good manufacturing practice
  - (D) good manufacturing of pharmaceuticals
- 54 If a new drug is already marketed and approved abroad:
- (A) phase 1-3 clinical trials are necessary in India
  - (B) bioequivalence and bioavailability studies are enough
  - (C) phase 3 clinical trials need to be conducted
  - (D) US-FDA approved drugs can be marketed without any trials in India
- 55 Which is a fish without true bones?
- (A) cuttlefish
  - (B) jellyfish
  - (C) shark
  - (D) rohu
- 56 Antibodies are useful in cancer therapy because:
- (A) they can destroy cancer cells directly
  - (B) they help in recognizing cancer cells for the body's immune system to destroy
  - (C) they do not distinguish between normal and cancer cells
  - (D) they can help cancer cells live longer

- 57 A normal G2 human cell has how many telomeres?  
(A) 46  
(B) 92  
(C) 184  
(D) 368
- 58 The following statement about diplococci is incorrect:  
(A) they are rod shaped bacteria  
(B) occur in pairs  
(C) pneumococcus is a diplococcus  
(D) they are round in shape
- 59 An instrument that produces short sequences of nucleic acids up to a few hundred base pairs:  
(A) peptide synthesizer  
(B) massively parallel synthesizer  
(C) DNA synthesizer  
(D) organic synthesizer
- 60 The study of drugs, their compositions and effects is called:  
(A) pharmacogenetics  
(B) pharmacology  
(C) evolution  
(D) personalized medicine
- 61 Because DNA is a highly charged polyanion, its stability to heat denaturation  
(A) does not depend on hydrophobic interactions  
(B) increases with increasing salt  
(C) is independent of G - C content  
(D) decreases with increasing salt
- 62 The most stabilizing force for nucleic acids is  
(A) hydrogen bonds  
(B) electrostatic bond  
(C) van der Waals  
(D) conformational entropy
- 63 A fat-soluble vitamin that regulates blood clotting is  
(A) vitamin A  
(B) vitamin K  
(C) vitamin C  
(D) niacin
- 64 Production of messenger RNA by gene transcription in eukaryotes does not require  
(A) methylation  
(B) polyadenylation  
(C) splicing  
(D) capping

- 65 Which one of the following is best method to determine bacteriophages concentration in a sample?  
(A) spectrophotometry  
(B) fluorescent microscopy  
(C) copy number assay  
(D) Plaque assay
- 66 Who proposed the preamble before the Drafting Committee of the Constitution ?  
(A) Dr. B. R. Ambedkar  
(B) Sir Alladi Krishnaswami Ayyer  
(C) Jawaharlal Nehru  
(D) M. K. Gandhi
- 67 The largest natural number which exactly divides the product of any four consecutive natural numbers is  
(A) 120  
(B) 24  
(C) 12  
(D) 6
- 68 Today 10th May 2018 is a Thursday. What day of the week will it be on 25th December, 2018 ?  
(A) Wednesday  
(B) Sunday  
(C) Monday  
(D) Tuesday
- 69 Acid rain is due to  
(A) O<sub>3</sub> and dust  
(B) SO<sub>2</sub> and NO<sub>2</sub>  
(C) SO<sub>3</sub> and CO  
(D) CO<sub>2</sub> and CO
- 70 IC chips are used in which generation of computer ?  
(A) second generation  
(B) third generation  
(C) fourth Generation  
(D) fifth Generation
- 71 Moving from one webpage to another webpage is known as  
(A) attaching  
(B) changing  
(C) downloading  
(D) browsing
- 72 How many miles were covered by MK Gandhi during Dandi march?  
(A) 200 Miles  
(B) 240 Miles  
(C) 250 Miles  
(D) 260 Miles

- 73 What is the name of Gujarat's state flower?  
(A) Marigold  
(B) Lotus  
(C) Rose  
(D) Mogra
- 74 How many members from Gujarat are represented in Parliament ?  
(A) 26  
(B) 24  
(C) 30  
(D) 22
- 75 Which Mughal emperor was born at Dahod, Gujarat ?  
(A) Akbar  
(B) Aurangzeb  
(C) Babar  
(D) Salim
- 76 Who is the first Gujarati laureate to win Jnanpith Award?  
(A) Rajendra shah  
(B) Umashanker Joshi  
(C) K. M. Munshi  
(D) Raghuveer Chaudhari
- 77 Which is the largest National park in Gujarat  
(A) Vanshda National Park  
(B) Marine National Park  
(C) Blackbuck National Park  
(D) Gir National Park
- 78 When was the law of RTI Act enacted by Government of India?  
(A) Oct-2005  
(B) Nov-2004  
(C) Apr-2005  
(D) Mar-1985
- 79 In which year the Civil Disobedience Movement was relaunched?  
(A) 1931  
(B) 1932  
(C) 1947  
(D) 1905
- 80 Which river flows through surat ?  
(A) Tapi  
(B) Godavari  
(C) Narmada  
(D) Mahi

- 81 The train had left before I ..... the station  
(A) reach  
(B) reached  
(C) was reaching  
(D) reaches
- 82 Give one word for: Constant effort to achieve something.  
(A) patience  
(B) vigour  
(C) perseverance  
(D) enthusiasm
- 83 His answer was such ..... I expected him to give.  
(A) as  
(B) which  
(C) that  
(D) like which
- 84 His attitude to his boss was so ..... that it caused a good deal of repulsion.  
(A) refulgent  
(B) hybrid  
(C) arrogant  
(D) sycophantic
- 85 The journey may be made by sea or ..... by road.  
(A) alternately  
(B) alternatively  
(C) falteringly  
(D) conversely
- 86 The boy was cured \_\_\_\_\_ typhoid.  
(A) from  
(B) of  
(C) for  
(D) through
- 87 A light breeze \_\_\_\_\_ the forest fire and made it more dangerous.  
(A) extinguished  
(B) lit  
(C) fanned  
(D) blew
- 88 A student will fail ..... he does not work hard  
(A) because  
(B) if  
(C) until  
(D) though

- 89 Either he or I .....responsible for the loss.  
(A) am  
(B) Is  
(C) are  
(D) You
- 90 I ..... smoke but I gave it up last year.  
(A) used to  
(B) ought to  
(C) need to  
(D) dare to
- 91 'બ્રેકફાસ્ટ' માટે ગુજરાતીમાં કયો શબ્દ વપરાય છે?  
(A) નાસતો  
(B) નાસ્તો  
(C) વાળુ  
(D) જમણ
- 92 રેલગાડીમાં પહેલી વાર બેસવાનો અનુભવ થયેલો. - સમાસ શોધો.  
(A) તત્પુરુષ  
(B) ઉપપદ  
(C) મધ્યમપદલોપી  
(D) દ્વિગુ
- 93 સમાનાર્થી શોધો વ્યવસ્થા  
(A) ગોઠણ  
(B) ગોઠવણ  
(C) વિરોધી અવસ્થા  
(D) વૃદ્ધાવસ્થા
- 94 વિરુદ્ધાર્થી શોધો શ્રીમંત  
(A) ધનવંત  
(B) નાશવંત  
(C) ગરીબ  
(D) કૃપાવંત
- 95 મેજબાન માટે શિષ્ટ શબ્દ, શોધો.  
(A) યજમાન  
(B) મહેમાન  
(C) મહેરબાન  
(D) ધનવાન

- 96 સંઘી કરો . વિ + અવહાર  
(A) વિવહાર  
(B) વીહાર  
(C) વિહાર  
(D) વ્યવહાર
- 97 શબ્દનો સંજ્ઞાનો પ્રકાર શોધો. સમુદ્ર  
(A) સમુહવાચક  
(B) ભાવવાચક  
(C) દ્રવ્યવાચક  
(D) જાતિવાચક
- 98 છંદ શોધો. અસત્યો માંહેથી પ્રભુ !  
પરમ સત્યે તું લઈ જા.  
(A) પૃથ્વી  
(B) મંદાકાન્તા  
(C) શિખરિણી  
(D) હરિગીત
- 99 સમાનાર્થી જોડકું શોધો.  
(A) કેશ - કેસ  
(B) સરિતા - સાગર  
(C) રમણી - સ્ત્રી  
(D) આયુધ - આયુષ
- 100 આપેલ વિકલ્પોમાં સમાનાર્થી ના હોય તે શોધો.  
(A) વેકળો  
(B) ઝરણું  
(C) વહેણ  
(D) ખાડો



Q.No	Option	Q.No	Option
1	C	51	A
2	A	52	C
3	A	53	C
4	B	54	C
5	A	55	C
6	A	56	B
7	B	57	C
8	A	58	A
9	C	59	C
10	D	60	B
11	A	61	B
12	B	62	C
13	C	63	B
14	B	64	A
15	D	65	D
16	C	66	C
17	D	67	B
18	D	68	D
19	C	69	B
20	D	70	B
21	C	71	D
22	D	72	B
23	B	73	A
24	C	74	A
25	D	75	B
26	A	76	B
27	B	77	D
28	C	78	A
29	D	79	B
30	B	80	A
31	A	81	B
32	B	82	C
33	A	83	A
34	C	84	D
35	D	85	B
36	B	86	B
37	C	87	C
38	A	88	B
39	A	89	A
40	A	90	A
41	B	91	B
42	A	92	C
43	A	93	A
44	B	94	C
45	B	95	A
46	B	96	D
47	C	97	D
48	B	98	C
49	A	99	C
50	B	100	D