SeqNo	Question	Option1	Option2	Option3	Option4	Correct Option
1	The process of determining the precise order of nucleotides within DNA is	DNA replication	Denaturation	Blotting	DNA sequencing	4
2	The Principle of Sanger's method relies on	Use of chemicals for base specific cleavage	Use of dNTPs for chain termination	Use of ddNTPs for chain termination	Use of for 32P chain termination	3
3	To sequence larger molecules, individual chromosomes are purified and broken into _____ or larger random fragments, which are cloned into vectors designed for large molecules.	100-Mb	100-kb	5000-kb	600-kb	2
4	What was the first animal to have its genome sequenced?	Drosophila melanogaster	Caenorhabditis elegans	Mus musculus	Homo Sapiens	2
5	ddNTPs are used in sequencing DNA because	ddNTPs are fluorescent	ddNTPs are incorporated very efficiently into DNA by DNA polymerase.	ddNTPs cannot be incorporated into DNA by DNA polymerase	ddNTPs prevent further DNA synthesis once they are incorporated into the DNA	4
6	Which type of DNA cleavage is done in the Maxam Gilbert method?	Base-specific	Interstitial	Gene-specific	Edge	1
7	What is the main enzyme component of Sanger sequencing?	Helicase	Polymerase	Nuclease	Gyrase	2
8	End labeled DNA sequencing is known as …….	Sanger's sequencing method	Maxam Gilbert method	Pyrosequencing method	Autosequencing method	2
9	Northern blotting is performed for.....	Determining the size of DNA	Determining the size of RNA	Quantification of RNA	Sequencing of RNA	3
10	Which of the following is NOT required for a PCR reaction?	A thermostable DNA polymerase	Dideoxy-dNTPs (ddNTPs)	Primers	Template DNA	2
11	..... can serve as an alternative to ethidium bromide to stain the DNA for detection on gel	Mitocycine C	SYBR Green I	Acridine orange	Evagreen	2
12	Which of the below sequencing techniques use(s) fluorescently labelled nucleotides for identifying the nucleotide sequence of the template DNA strand?	PacBio	Oxford Nanopore	PacBio AND Ion Torrent	Only Illumina	4
13	What does the phred quality score of 30 assigned to a nucleotide indicate?	Probability of incorrect base call 1 in 1000 times	Probability of a correct base call 1 in 1000 times.	Probability of a correct base call 1 in 30 times.	Probability of an incorrect base call 1 in 30 times	1

14	Which of these is the most important aspect of planning and designing a good sequencing experiment?	Careful choice of sample(s) and control(s)	Effective data analysis	Robust and precise experimental methods	All of the above	4
15	Which of the below sequencing techniques require DNA amplification during the library preparation step?	PacBio AND Oxford Nanopore	Illumina AND Ion Torrent	Illumina AND Oxford Nanopore	PacBio AND Ion Torrent	2
16	The ordered steps for the Sanger sequencing sample preparation involves: 1) Capillary electrophoresis 2) Cycle sequencing PCR 3) Purification after Cycle sequencing PCR 4) Template Preparation	1,3,2,4	2,3,4,1	2,4,3,1	4,2,3,1	4
17	How many base pairs are there in one full turn of the DNA double helix?	9	10	11	12	2
18	Which technique was used to determine the double-helical structure of DNA?	electrophoresis	X-ray crystallography	chromatography	centrifugation	2
19	What is a probe?	Chemically synthesized DNA	Purified DNA	Fragmented DNA duplex	Either purified or synthesized single stranded DNA	4
20	Which of the following statement are correct as to why the quantity of template used is critical to a sequencing reaction?	Excess template reduces the length of a read	Too little template will result in no readable sequence	Excess template reduces the quality of a read	All of the above	4
21	The first significant DNA sequence to be obtained was that of	Lambda	Pasmid	Lactose	Mammals	1
22	Which of the following is used by DNA polymerase as a substrate?	Sucrose	Lactose	Nucleotide	Nucleoside	3
23	The Klenow fragment is basically a	DNA hybrid	DNA polymerase	RNA polymerase	Promoter	2
24	. ..... is a chemically synthesized oligonucleotide.	Klenow fragment	DNA	Primer	RNA	3
25	RT-PCR is a method that is used for	forensic analysis of DNA	amplification of genomic DNA sequences	amplification of mRNA sequences	analysis of mRNA expression.	4
26	Which of the following is not required for Sanger sequencing?	DNA quantification	Electrophoresis	Cloning	PCR	3

27	What is the possible cause for showing many small extraneous peaks appearing next to a high-intensity peak in genotyping run	Sample concentration is too high	Sample concentration is too low	Low affinity of the primer to the template	None of the above	1
28	What are the basic base-specific cleavage sites used in Maxam and Gilbert method?	A, T, G, C	C, T, A+G, T+C	A, G, A+T, G+C	G, C, A+G, C+T	4
29	Which enzyme is used for the replication in case of Sanger's method of sequencing?	Polymerase I	Smaller subunit polymerase I	Polymerase III	Larger subunit polymerase I	4
30	How many different types of chemical treatments are required in Maxam-Gilbert method?	1	2	3	4	4
31	The process of electrophoresis is the key to Sanger sequencing.	1	0	Plants only	Insects only	1
32	With respect to Sanger's enzymatic method of sequencing pick the odd one out.	Radioactive dideoxyribonucleotides	Primers	Klenow fragment	Restriction digestion	4
33	When setting up a Sanger sequencing reaction, each reaction should include template DNA, nucleotides, dideoxynucleotides, buffer, DNA polymerase, and.....	Forward and Reverse Primer	Forward and Reverse Probe	Forward or Reverse Primer	Forward or Reverse Probe	3
34	You need to use a first generation sequencing method for de novo sequencing, which template should give optimum results for this project	Bacterial artificial chromosome (BAC)	Genomic DNA	Plasmid DNA	Genomic DNA	1
35	What will heterozygous single nucleotide substitution look like on your chromatogram	Two peaks of equal height at the same position	Two peaks in the same position, one twice the height of the other	Three peaks of equal height at the same position	One peak twice the height of those around it	1
36	Sanger Sequencing reactions can read DNA fragments up to ..... in length	1 Kb	1 km	1 Mb	1 Gb	1
37	The sample in Sanger's method after reaction are separated using	PFGE	PAGE	AGE	2-D Gel electrophoresis	2
38	Which of the following is not a DNA Sequencing method?	LMPCR	Sanger's method	Maxam-Gilbert Method	Edmans method	4
39	DNA Sequencing refers to the	technique used to determine the sugar sequence in a DNA molecule	technique used to determine the phosphate sequence in a DNA molecule	technique used to determine the base sequence in a DNA molecule	All of the these	3
40	The backbone of DNA is	neutral	hydrophilic	hydrophobic	None of the above	2

41	An increase Tm (Melting temperature) for a ds-DNA may be due to high content of	A+T	G+C	A+G	None of the above	2
42	As far as Absorbance of DNA at 260nm. Which of the following is correct?	dsDNA> ssDNA> individual nucleotides	individual nucleotides> ssDNA > dsDNA	ssDNA> dsDNA > individual nucleotides	Absorbance remains same	2
43	Which is the most stable form of DNA under normal physiological condition?	A-DNA	H- DNA	Z-DNA	B-DNA	4
44	Dehydration of DNA samples may induce the formation of	A-DNA	H- DNA	Z-DNA	B-DNA	1
45	Which of the following software is used for fragment analysis?	Gene Mapper	DNA Scanner	Fragment Mapper	KB basecaller	1
46	Which of the following method is best for purification of PCR products for sequencing?	Column Purification	Ethanol Purification	Magnetic bead based purification	Gel Purification	3
47	How many fragments are present in GeneScan 500 LIZ Size Standard under denaturing conditions?	15	16	17	18	2
48	Which size standard is recommended for analysis of tri- and tetranucleotide microsatellite loci, which can often exceed 400 bp in length?	GeneScan 500 LIZ Size Standard	GeneScan 120 LIZ Size Standard	GeneScan 600 LIZ Size Standard	GeneScan 1200 LIZ Size Standard	1
49	What is the possible cause for Size-standard peaks are not migrating as expected during a normal genotyping run time?	Poor quality Sample	Degraded or frozen polymer	Low ionic buffer strength	all of the above	4
50	The whole-genome shotgun sequencing approach depends primarily on	rapidly sequencing thousands of small randomly cloned fragments	methodical sequencing a few large cloned fragments of DNA	sequencing the bacterial chromosome while it is still intact	all of the above	1