Biochemistry (XL-Q)

Q.1 – Q.10 Multiple Choice Question (MCQ), carry ONE mark each (for each wrong answer: – 1/3).

Q.1	**Which one of the following molecules (~ 1mg/mL) do NOT absorb at 280 nm in an aqueous solution of pH 7.00 at room temperature?**
(A)	Poly deoxy-Guanylate (poly dG)
(B)	Adenosine triphosphate
(C)	Phenylalanine
(D)	Tyrosine

Q.2	**A molecule that forms a donor-acceptor energy transfer pair with the dansyl group is _____**
(A)	Aspartate
(B)	Histidine
(C)	Lysine
(D)	Tryptophan

Q.3	**The stationary phase used in gel filtration chromatography is composed of ____**
(A)	Blue dextran
(B)	Carboxymethyl (CM) cellulose
(C)	Diethylaminoethyl (DEAE) cellulose
(D)	Sepharose

Q.4	**According to the "wobble hypothesis" inosine at the third position of the anticodon cannot form hydrogen bonds with _____**
(A)	Adenine
(B)	Cytidine
(C)	Guanine
(D)	Uracil

Q.5	**pKa value of the guanidinium group of Arginine is _____**
(A)	4.30
(B)	7.40
(C)	9.20
(D)	12.50

Q.6	**The non-coenzyme vitamin is _____**
(A)	Ascorbic acid
(B)	Folic acid
(C)	Nicotinic acid
(D)	Thiamine

Q.7	**Telomerase has a function similar to _____**
(A)	DNA dependent DNA polymerase
(B)	RNA polymerase
(C)	DNA gyrase
(D)	Reverse transcriptase

Q. 8	**Which one of the following enzymes is used in Polymerase Chain Reaction ?**
(A)	Klenow fragment
(B)	Taq polymerase
(C)	T7 polymerase
(D)	Primase

Q. 9	**In hepatocytes, the detoxification of drugs occurs in _____**
(A)	Golgi apparatus
(B)	Nucleolus
(C)	Rough endoplasmic reticulum
(D)	Smooth endoplasmic reticulum

Q.10	**Which one of the following antibiotics can form an ion channel in the bacterial membrane?**
(A)	Ampicillin
(B)	Gramicidin A
(C)	Gentamicin
(D)	Rifampicin

Q.11 – Q.12 Multiple Choice Question (MCQ), carry TWO mark each (for each wrong answer: – 2/3).

Q.11	**Which one of the following cells lack hypoxanthine-guanine phosphoribosyltransferase (HGPRT)?**
(A)	B Cell
(B)	T Cell
(C)	Macrophage
(D)	Myeloma Cell

Q.12	**Which of the following lipids is non-ionic?**
(A)	Sphingomyelin
(B)	Galactocerebroside
(C)	Lecithin
(D)	Phosphatidyl inositol

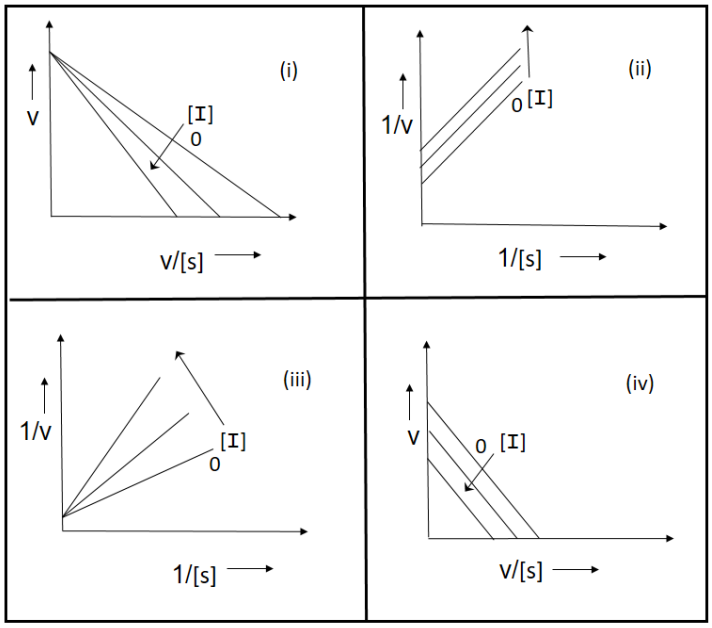
Q.13 – Q.20 Multiple Select Question (MSQ), carry TWO mark each (no negative marks).

Q.13	**Anti-B antibodies are present in the serum of _____**
(A)	Blood group A
(B)	Blood group B
(C)	Blood group AB
(D)	Blood group O

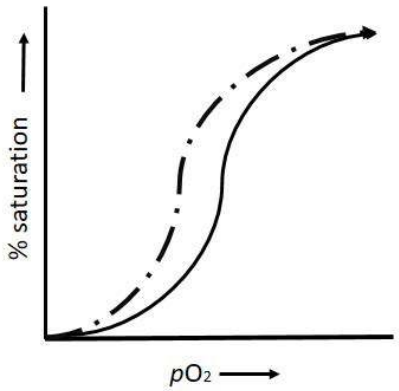
Q.14	**Which of the following are energy requiring processes?**
(A)	Facilitated diffusion
(B)	Active transport
(C)	Nonmediated transport
(D)	Na^+/K^+ transport

Q.15	**Which of the following are correctly paired?**
(A)	Replication: DnaA
(B)	Recombination: RecA
(C)	DNA repair: Rho factor
(D)	Transcription: Sigma factor

Q.16	**The high energy compound(s) is/are:**
(A)	Phosphoenol pyruvate
(B)	Adenosine monophosphate
(C)	1,3-Bisphosphoglycerate
(D)	Vitamin K

Q.17	**Given below are four plots obtained from separate experiments on enzyme inhibition kinetics. The velocity (v) of the reaction is plotted at varying concentrations of substrate (s) and inhibitor (I). The plot(s) corresponding to competitive inhibition is/are** 
(A)	(i)
(B)	(ii)
(C)	(iii)
(D)	(iv)

Q.18	**With respect to sodium dodecyl sulphate - polyacrylamide gel electrophoresis (SDS-PAGE), which of these statement(s) is/are true?**
(A)	Ethidium bromide is used to track the progress of electrophoretic mobility
(B)	β-mercaptoethanol is used to reduce disulphide bonds
(C)	The protein migrates towards the anode
(D)	The lower molecular weight protein migrates slower than the larger molecular weight protein

Q.19	**In the plot given below, the solid line represents oxygen binding to hemoglobin under physiological conditions. The broken line represents the condition(s) of** 
(A)	High CO_2 concentration
(B)	Increase in 2,3- Bisphosphoglycerate concentration
(C)	High pH
(D)	Loss of cooperativity

Q.20	**Considering the open chain forms, which of the following pair(s) represent/s an epimer?**
(A)	D-mannose and D-fructose
(B)	D-glucose and D-mannose
(C)	D-glucose and D-fructose
(D)	D-galactose and D-glucose

END OF THE QUESTION PAPER

Graduate Aptitude Test in Engineering (GATE 2021)

Paper / Section : Life Sciences (XL) / Biochemistry (XL-Q)

Q. No.	Session	Question Type MCQ/MSQ/NAT	Section Name	Answer Key/Range	Marks	Negative Marks
1	6	MCQ	XL-Q	C	1	1/3
2	6	MCQ	XL-Q	D	1	1/3
3	6	MCQ	XL-Q	D	1	1/3
4	6	MCQ	XL-Q	C	1	1/3
5	6	MCQ	XL-Q	D	1	1/3
6	6	MCQ	XL-Q	A	1	1/3
7	6	MCQ	XL-Q	D	1	1/3
8	6	MCQ	XL-Q	B	1	1/3
9	6	MCQ	XL-Q	D	1	1/3
10	6	MCQ	XL-Q	B	1	1/3
11	6	MCQ	XL-Q	D	2	2/3
12	6	MCQ	XL-Q	B	2	2/3
13	6	MSQ	XL-Q	A; D	2	0
14	6	MSQ	XL-Q	B; D	2	0
15	6	MSQ	XL-Q	A; B; D	2	0
16	6	MSQ	XL-Q	A; C	2	0
17	6	MSQ	XL-Q	A; C	2	0
18	6	MSQ	XL-Q	B; C	2	0
19	6	MSQ	XL-Q	C	2	0
20	6	MSQ	XL-Q	B; D	2	0