Section L: Microbiology

Q, 1 - Q, 10 carry one mark each.

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ta mirogan (Ni) gas. How many o	t by a fe lectron	s bet uittoß om Bto:.bs o	of bacter en atom	na reduces nit are transferre	rate (NO ₁) d to nitrate
A) 2	(B) 3		(C) 4		(D) 5	
Metabolica nucleorgan	eld of a product	being	produced	by an	industrially	important
(B) gram pro(C) gram pro	duct formed / gram conduct formed / litre of	ells forr culture	ned			
Vaich of tes	following features ca	ın distir	guish Bacte	ria and	Archea?	
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bistema (A+Presence (B-Sulphor) (C, Oxygoni	of bacteriochlorphyll leposition outside the mode of photosynthe	s cell wa		en sulpi	iur ph <mark>otosynt</mark>	h <mark>e</mark> tic
The microorgue known as	anisms which obtain	energy	from the ox	idation	of morg <mark>an</mark> ic c	compounds
(A) Photoaut: (C) Photohes	strophs stotrophs		(B) Chen (D) Chen	iohthotr joorgans	ophs outophs	
	o Vefic oracle of Vefic oracle or other scale or other scale or other process. All 2. Metabolic of the control or other process. (A) gram process of the control or other o	Description of the Several Security of the cell wall Which of the following feature is a few and the cell wall Which of the following feature is a few cell wall Which of the following feature is a few cell wall Which of the following feature is a few cell wall Which of the following feature is a few cell wall Which of the following feature is a few cell wall Which of the following feature is a few cell wall Which of the following feature is a few cell wall Which of the following feature is a few cell wall Which of the following feature is a few cell wall Which of the following feature is a few cell wall Which of the following feature is a few cell wall Note that the following feature is a few cell wall Note that the following feature is a few cell wall Note that the following feature is a few cell wall Note that the following feature is a few cell wall of the cell wall.	A very responsible for the 'Severe Acuse Very research out by a fearanting on (N ₂) gas. How many electrons in the process A) 2 (B) 3 Metabolic yield of a product being interfect and is defined as (A) gram product formed / gram substrate (B) gram product formed / litre of culture (D) gram product formed / litre of culture (D) gram product formed / (litre in hour) Which of the following features can disting the Absence of internal membraneous organs (D) Presence of N-acetylglucosamine in the cell wall Which of the following feature is not exhibit or the cell wall Which of the following feature is not exhibit or the cell wall Which of the following feature is not exhibit or the cell wall Which of the following feature is not exhibit or the cell wall (A) Presence of bacterochlorphylls (B) Sulphur deposition outside the cell wall (C) Oxygenic mode of photosynthesis (D) Non motile nature of cells The microorganisms which obtain energy are known as.	When tespensible for the 'Severe Acute Respirate a Velic charges (B) Coro (D) Influ constructed acute process carned out by a few groups of the acute process (A) 2. (B) 3. (C) 4. Metabolic Scald of a product being produced the foregam and is defined as (A) gram product formed / gram substrate consumed (B) gram product formed / fitte of culture broth (D) gram product formed / litre of culture broth (D) gram product formed / (litre in hour) Which of the following features can distinguish Bacte (C) Absence of the membrane-enclosed nucleus (E) Absence of internal membranous organelles (E) The typical glycosidic bonds present in the peptid of the cell wall (C) Presence of N-acetylglucosamine in the peptidog the cell wall (C) Oxygene mode of photosynthesis (D) Non motile nature of cells The microorganisms which obtain energy from the ox are known as (A) Photoautotrophy (B) Chem	(B) Corona risus (C) Influence vin Interactive attention process carried out by a few groups of bacter traintrogen (Ng) gas. How many electrons per nitrogen atom in the process (A) 2 (B) 3 (C) 4 Metabolic yield of a product being produced by an interactive attention process (A) gram product formed / gram substrate consumed (B) gram product formed / gram cells formed (C) cram product formed / litre of culture broth (D) gram product formed / litre of culture broth (D) gram product formed / (litre in hour) Which of the following features can distinguish Bacteria and (A) Absence of the membrane-enclosed nucleus (A) Absence of internal membranous organelles (A) The type of glycosidic bonds present in the peptidoglycan of the cell wall (A) Presence of N-acetylglucosamine in the peptidoglycan la tho cell wall Which of the following feature is not exhibited by green sulpl Societica (A) Presence of bacteriochlorphylls (B) Sulphur deposition outside the cell wall (C) Oxygent, mode of photosynthesis (D) Non mode nature of cells The microorganisms which obtain energy from the oxidation are known as (A) Photoautotrophy (B) Chemofuthoto.	(B) Coronavirus (B) Coronavirus (C) Influenza virus (D) Influenza virus (E)

Q.8	Neutrophiles excha	n'ge potassium for pr	oton using	
	(A) Antiport transport (C) ABC transport	on system system	(B) Symport transfor (D) Group Transfor	
Q.9	Amphotericin B se affinity for a comp	lectively disrup's the ound present in fung	cell membrane of fungul membrane. The name	because of its high of this compound is
	(A) Ergosterol	(B) Mannitol	(C) M-conazole	(D) Cletomazole
Q.10	Which of the follow	king 'hepatitis virus'	has DNA genome	~
	(A) Henantis A	(B) Hepatitis B	(C) Hepatitis C	(D) Hepatitis 1:
		WAR (1984) Vigge - gang (1994) (1995)	NOVEMBER DESCRIPTION	
		Q :: Q. 26 carry	two mark: Jacn.	
Q.11	Which of the follow and catalase enzym	ving groups of micro as for growth?	organisms contain both	superoxide dismittase
	(A) Obligate aerob (B) Facultative and (C) Strict anaerobe (D) Both obligate a	erobes only	ve anaerobes	
Q.12	Which of the folloaction	wing is not responsi	ble for making bacteria	a resistant to penicillin
	(B) Inability of per	penicillin binding pro	steins te of action	
Q.13	(C) Inability to bin (D) Presence of pla	d to 30S ribosomal si ismid coding for peni	ubunit	rganism producing a
Q.13	(C) Inability to bin (D) Presence of pla	d to 30S ribosomal si smid coding for peni ombination of the an	ubunit icillinase utibiotic and the micross	and the second second second
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- Q.14 The pathogenesis associated with Vibrio cholerae infection depends on the colonization of the small intestine by the organism and secretion of an enteroto-in Which of the following statement related to pathogenicity of cholera is incorrect?
 - (A) Vibrio cholerae secretes the enterotoxin choleragen
 - (B) Choleragen consists of A (active) and B(binding) subunit
 - (C) Choleragen toxin alone cannot reproduce the symptoms of cholera in the above of of Vibrio cholerae
 - (D) CTX bact riophage carries the genes of cholera toxin and other virulence to Take
- Q.15 Prior infection of Mycahacterium tuberculosis can be detected by positive tuberculos skin test result. The basis of this test is
 - (A) Anaphylactic hypersensitivity (Type !)
 - (B) Antibody dependent cytotoxic hypersensitivity (Type II)
 - (C) Immune complex mediated hypersensitivity (Type III)
 - (D) Cell mediated or delayed hypersensitivity (Type IV)
- Q.16 A bacterial culture on being transferred from anaerobic to aerobic condition of growth drastically reduce the rate of glucose catabolism. This regulatory phonomenon is known as
 - (A) Tyndullization (B) Pasteurization (C) Crubtree effect (D) Pasteur effect
- Q.17 Which of the following statements related to 'High frequency recombination' (Hfr) cells is incorrect
 - (A) Single strand of DNA that enters into recipient F cell contains a piece of the F factor at the leading end followed by the bacterial chromosomes and then by the remainder of the F factor
 - (D) Most mating results in the transfer of only a portion of donor chromosome because the attachment between the two cells can break
 - (C) The bacterial genes adjacent to the leading piece of the F factor are least frequently transferred
 - (D) The donor cell genes that are transferred vary, since the F plasmid can integrate at several different sites in a bacterial DNA
- Q.18 Replication of the positive strand genome of poliovirus requires
 - (A) Reverse Transcriptase
 - (B) Virus encoded RNA dependent RNA polymerase
 - (C) DNA dependent RNA polymerase
 - (D) DNA nolymerase
- Q.19 Which of the following statement about bacteriophage λ is incorrect?
 - (A) It initially produces two proteins; one acts as an inhibitor of λ repressor synthesis and the other acts as a terminator for transcription
 - (B) It maintains its lysogenic state in the absence of an inducer
 - (C) In switching from the lysogenic to the lytic phase, it turns off the synthesis of λ repressor because cr. cin bands to λ operator On3.
 - (D) It forms N and Q gene products which act as positive regulatory proteins leading to the sequential production of λ succeed proteins.

Q20 While evaluating the effectiveness of a distribution. X-against Salmonella typhi by the Phenol-Coefficient Stath of the colors in distribution with a property obtained.

		Sursculture Tubes			
		≤ min	10 min	15 mi	
Disinfectant (X)	West 15, 100 31	- 0	0	0	
	111100	9	Ű	0	
	1 150	+	9	0	
	4:178	+		0	
	1.200	- //	4	+	
Phenol	42	10	0	0	
	1:100	*	4+	+	

0 = no growth, + = grav

The Phenol-Coefficient of the disinfectant (A. would be

- (A) 1.66
- (B) 3.32
- (C) USO
- (D) 1.00

Q.21 Lactic acid busteria ferment glucuse to produce two moles of lactic acid. What is the net yield of ATP and NovDH per mole of glucuse?

- (A) 2 ATP and 2 NADH
- (B) 2 ATP and 0 NADH
- (C) 4 ATP and 2 NADH
- (D) 4 ATP and 0 NADH

Common Data Questions

Common Data for Questions 22, 23, 24: Analysis of the electron transport system in a newly isolated aerobic Gram-positive bacterium showed the existence of five electron transport molecules. Their redox potentials are as fallows:

Oxidant	Reductant	Electrons transferred	Eo' (volts)	
P	PH ₂	2	1-0.13	
NAD*	NADH	12	- 0.32	
R	RH ₂	2	- 0.02	
Cytochrome c (+3)	Cyrechrome c (+2)	11	+ 0.22	
S	SH ₂	2	+ 0.63	

Faraday constant $_{4}F_{1}=23 \text{ k rap/voltimole}$

Q 22 Which of the following sequence of the electron transport carriers would be involved in the transport of electrons for energy generation?

- (A) $P \rightarrow NAD^* \rightarrow R \rightarrow Cytochrome \bot \rightarrow S$
- (B) $NAD^* \rightarrow P \rightarrow R \rightarrow Cytochrome c \rightarrow S$
- (C) NAD^{*} → P → Cytochrome c → R → S
- (D) NAD' \rightarrow Cytochrome $c \rightarrow P \rightarrow R \rightarrow \%$

Q.23 If the electrons are transferred from NADE to Salke difference in redox potential would be

- (A) + 9.95
- (B) + 0.76
- (C) 1195
- (D) = 0.76

What would be the value of standard free charry change for the fig. sfer of elections from PHs to \$2.

to the scale of the state of the state of the State of

Common Data for Questions 25, 26: E. coli can metabolize both glucose and lactose sugar as sole source of carbon and energy. While glucose catabolizing enzymen are constitutive factose catabolizing enzymes are induced in the presence of compounds such as factose IPTG, etc. Lactose catabolizing enzymes are also regulated by catabolite repression.

- Q.25 Assume that E. coli has been grown in a nutrient medium containing factose only. When the culture has reached the logarithmic phase of growth, the cells are harvested and transferred to a medium containing glucose only. Would you expect the culture to
 - (A) Continue to grow in its logarithmic phase
 - (B) Exhibit a lag phase first and then grow again in its logarithmic phase
 - (C) Undergo lysis
 - (D) Stop growth
- Q 26 If the E. coli cells are grown in a medium containing both glucose and factose, what is likely to happen?
 - (A. Both the sugars would be utilized simultaneously
 - (B) The culture will exhibit synchronous growth,
 - (C) Luctose will be utilized first followed by glucose
 - (D) Glucose will be utilized first followed by lactose

Linked Answer Questions: Q27a to Q28b carry two marks each

Statement for Linked Answer Questions 27a & 27b:

Consider a nutrient medium containing 2 X 10⁴ cells. The culture is incubated at 25°C under acrobic conditions for growing the cells. The generation time of the cells is 40 minutes.

- Q 27a If the culture is allowed to grow for 8 hours, how many generations would have taken place?
 - (A) 8
 - (B) 12
 - (C) 16
 - (D) 24
- Q.276 What will be the cell population after 8 hours ?
 - (A) 4.1 X 10⁵
 - (B) 8.2 X 10⁶
 - (C) 4.1 X 10⁷
 - (D) 8.2 X 10⁷