Test Name : BT101_QUIZ_04

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Test Start Time	Marks Scored	Total Questions
2021-06-20 09:30:15	14.754999999999999 / 25.0	48

Attempted Questions	Correct Questions	Incorrect Questions
45	33	12

Skipped Questions	Pending Evaluation
3	0

Status of application for viewing evaluated answers: **Not Applied**

Actions: Apply for viewing evaluated answers

List of Sections

Section - 1 — Marks per question : 0.5 | **Marks Scored : 2.25** | Negative marks per question : 25%

Q No.	Q. Type	Status	Marks	Comment	
1	Multiple Choice - Single Answer	✖	-0.12	-	Hide Answer

DNA polymerase III:

- does not require a primer molecule to initiate replication.
- contains a 5' →3' proofreading activity to improve the fidelity of replication.
- synthesizes only the leading strand; DNA polymerase I synthesizes the lagging strand.
- ◉ synthesizes DNA in the 3' → 5' direction.
- has a subunit that acts as a circular clamp to improve DNA synthesis.

Q No.	Q. Type	Status	Marks	Comment	
2	Multiple Choice - Single Answer	✔	0.5	-	Hide Answer

Insulin, is a protein, consisting of

- 3 Polypeptide chains
- ◉ 2 Polypeptide chains
- more than 4 polypeptides chains
- 4 Polypeptide chains

Q No.	Q. Type	Status	Marks	Comment	
3	Multiple Choice -	✔	0.5	-	Hide Answer

Single

Processing of a primary mRNA transcript in an eukaryotic cell does not normally involve:

- (●) conversion of normal DNA into RNA.
- ( ) attachment of a long poly(A) sequence at the 3' end
- ( ) capping at the 5' end.
- ( ) joining of exons.
- ( ) excision of intervening sequences (introns).

4 | Multiple Choice - Multiple Answers | ✖ | -0.12 | - | Hide Answer

Compared with DNA polymerase, how RNA Polymerase is different?

- [ ] It introduces no errors into genetic material because it synthesizes RNA, not DNA.
- [x] It does not require a primer to initiate synthesis
- [x] It synthesizes complementary strands in the opposite direction from 3' → 5'.
- [x] It makes more errors because it has poor 3' → 5' proofreading exonuclease activity.
- [ ] It makes fewer errors in synthesizing a complementary polynucleotide.

5 | Multiple Choice - Single Answer | ✖ | -0.12 | - | Hide Answer

After binding by E. coli RNA polymerase, the correct order of events for transcription initiation is:

- ( ) closed complex formation, open complex formation, start of RNA synthesis, promoter clearance.
- (●) closed complex formation, open complex formation, promoter clearance, start of RNA synthesis.
- ( ) start of RNA synthesis, open complex formation, closed complex formation, promoter clearance.
- ( ) start of RNA synthesis, closed complex formation, open complex formation, promoter clearance.
- ( ) open complex formation, closed complex formation, start of RNA synthesis, promoter clearance.

6 | Multiple Choice - Single Answer | ✖ | -0.12 | - | Hide Answer

In a recessive genetic disease, a single base pair change in a gene alters the *Eco*RI restriction site such that it is no longer recognized by the enzyme. You collect cells from a new born baby with the disease and amplify the disease gene via PCR. Next, you digest the PCR product with *Eco*RI and run the digested product on a gel. How many bands of DNA would you expect on the gel?

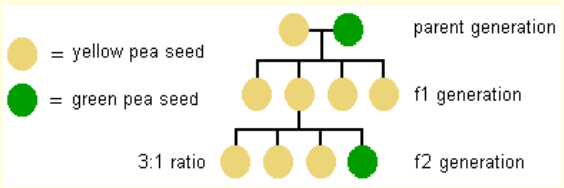
- (●) 2
- ( ) 1

4

3

7 | Multiple Choice - Single Answer | ✔ | 0.5 | - | Hide Answer

In the diagram below, what accounts for the green pea seed in the F2 generation?



Because both parents passed on yellow alleles.

The F1 generation parents are homozygous yellow.

All of the options

The yellow allele is dominant over the green one.

On average, 1 out of 4 offspring of heterozygous parents will be homozygous recessive.

8 | Multiple Choice - Single Answer | ⚠ | 0.0 | - | Hide Answer

Assuming that the average amino acid residue contributes 110 to the peptide molecular weight, what will be the minimum length of the mRNA encoding a protein of molecular weight 24,970?

133 nucleotides

1,400 nucleotides

681 nucleotides

A minimum length cannot be determined from the data given

5,000 nucleotides

9 | Multiple Choice - Single Answer | ✔ | 0.5 | - | Hide Answer

Which one of the following is true about the genetic code?

It is absolutely identical in all living things.

All codons recognized by a given tRNA encode different amino acids

The first position of the tRNA anticodon is always adenosine.

The base in the middle position of the tRNA anticodon sometimes permits “wobble” base pairing with two or three different codons.

Several different codons may encode the same amino acid.

10 | Multiple Choice - Single Answer | ✔ | 0.5 | - | Hide Answer

The size of the DNA region specifically recognized by type II P restriction enzymes is typically:

- 200 to 300 base pairs.
- about the size of an average gene.
- 10 to 15 base pairs.
- **4 to 8 base pairs.**
- 50 to 60 base pairs.

11 | Multiple Choice - Single Answer | ✔ | 0.5 | - | Hide Answer

Which one of the following statements about enzymes that interact with DNA is true?

- Endonucleases degrade circular but not linear DNA molecules.
- **DNA polymerase I is unusual in that it possesses only a 5' → 3' exonuclease activity.**
- Primases synthesize a short stretch of DNA to prime further synthesis.
- Many DNA polymerases have a proofreading 5' → 3' exonuclease.
- **Exonucleases degrade DNA at a free end.**

12 | Multiple Choice - Single Answer | ⚠ | 0.0 | - | Hide Answer

The E. coli recombinant plasmid pBR322 has been widely utilized in genetic engineering experiments. pBR322 has all of the following features except:

- **a number of palindromic sequences near the EcoRI site, which permit the plasmid to assume a conformation that protects newly inserted DNA from nuclease degradation.**
- a number of conveniently located recognition sites for restriction enzymes.
- small overall size, which facilitates entry of the plasmid into host cells.
- resistance to two different antibiotics, which permits rapid screening for recombinant plasmids containing foreign DNA.
- a replication origin, which permits it to replicate autonomously.

13 | Multiple Choice - Single Answer | ✖ | -0.12 | - | Hide Answer

You perform a sequencing reaction and forget to add ddTTP. When the sequencing reactions are run on a gel, which of the following statements is true?

All of the lanes will have bands, but will be incorrectly sized.

None of the lanes will have bands.

None of the options

The T lane will have mostly longer fragments.

The T lane will have no bands.

14	Multiple Choice - Single Answer	✖	-0.12	-	Hide Answer

The PCR reaction mixture does not include:

DNA containing the sequence to be amplified

All four deoxy nucleoside triphosphates

Oligonucleotide primers

Heat stable DNA polymerase

DNA ligase

Section - 2 Marks per question : 1.0 | **Marks Scored : 1.88** | Negative marks per question : 25%

Q No.	Q. Type	Status	Marks	Comment	
1	Fill in the Blanks	✖	-0.25	-	Hide Answer

A culture of bacteria growing in a medium containing N14 is switched to medium containing N15 for four generations (16-fold increase).

a) Find the molar ratio of (N14-N15) to (N15-N15) = 15 Expected Solutions: 0.14 0.143 (in decimals).

2	Fill in the Blanks	✔	1.0	-	Hide Answer

A bacterial plasmid contains 5996 bp. This plasmid initially has a superhelical density of -0.06 and during replication the fork stall as the superhelical density of the DNA ahead of fork reaches +0.14.

a) Calculate the total number of turns which brings the superhelical density to +0.14 i.e. the stalling point = 114 turns (integers)

b) How many base pairs will be unwound and replicated before the fork stalls? = 1199 bps (integers)

3	Fill in the Blanks	✔	1.0	-	Hide Answer

Green Fluorescent Protein (GFP) was isolated from aequorea victoria.

Aequorin protein emits blue color.

Taq polymerase was isolated from Thermus aquaticus .

First rDNA was constructed by Paul Berg .

Q No.	Q. Type	Status	Marks	Comment	
4	Fill in the Blanks	✖	0.38	-	Hide Answer

A plasmid contains 4639215 bp.

a) Write how many turns of the double helix must be unwound during replication = 441830 **turns** (integers)

b) How long (in minutes) it would take to replicate the plasmid, when the rate of synthesis is 1000 bp/s = 77.32025 Expected Solutions: **38.66** **mins** (decimals)

Q No.	Q. Type	Status	Marks	Comment	
5	Fill in the Blanks	✖	-0.25	-	Hide Answer

A gene contains a 3 kb promoter region, a 5′UTR of 120 bp and a 3′ UTR of 250 bp. It is also composed of three exons (2 kb, 3 kb and 4.5 kb) and two introns (0.5 kb and 2.5 kb). What would be the length of the matured mRNA?

ANS = 13.85 Expected Solutions: **9.87** **kb** (in decimals)

Section - 3

Marks per question : 0.25 | **Marks Scored : 2.88** | Negative marks per question : 25%

Q No.	Q. Type	Status	Marks	Comment	
1	Multiple Choice - Single Answer	✔	0.25	-	Hide Answer

In the cochlea, the major cation in endolymph is sodium and the major cation in perilymph is potassium.

- (●) False
- ( ) True

Q No.	Q. Type	Status	Marks	Comment	
2	Multiple Choice - Single Answer	✔	0.25	-	Hide Answer

Taste buds are present only on the tongue.

- (●) False
- ( ) True

Q No.	Q. Type	Status	Marks	Comment	
3	Multiple Choice - Single Answer	✔	0.25	-	Hide Answer

Monosodium glutamate is a popular ingredient added to processed foods to give sweet taste.

- (●) False
- ( ) True

4	Multiple Choice - Single Answer	✔	0.25	-	Hide Answer

The cochlea of the inner ear is snail shaped that enable us to hear different frequency sounds (20 Hz to 20 kHz).

- False
- True

5	Multiple Choice - Single Answer	✖	-0.06	-	Hide Answer

In bright light, the pupil reduces in size as the radial muscles of the iris contract.

- False
- True

6	Multiple Choice - Single Answer	✔	0.25	-	Hide Answer

In multiple sclerosis, the immune system attacks the protective myelin sheath that covers nerve fibers and causes communication problems between the brain and the rest of the body.

- False
- True

7	Multiple Choice - Single Answer	✔	0.25	-	Hide Answer

Efferent neurons are also called motor neurons.

- False
- True

8	Multiple Choice - Single Answer	✔	0.25	-	Hide Answer

The spleen is responsible for producing the hormone thymosin which in turn aids in the production of T cells.

- False
- True

9 | Multiple Choice - Single Answer | ✔ | 0.25 | - | Hide Answer

Receptors are made up of lipid molecules inside the target cell or on its surface that receive a chemical signal.

- (●) False
- ( ) True

10 | Multiple Choice - Single Answer | ✔ | 0.25 | - | Hide Answer

The vestibular nerve transmits sound (hearing) and equilibrium (balance) information from the inner ear to the brain.

- (●) False
- ( ) True

11 | Multiple Choice - Single Answer | ✔ | 0.25 | - | Hide Answer

The grey matter has a pinkish and yellowish hue in its grey color, which comes from cell bodies of neurons and blood capillaries.

- ( ) False
- (●) True

12 | Multiple Choice - Single Answer | ✔ | 0.25 | - | Hide Answer

The lymphatic system is a macroscopic waste clearance system that utilizes glial-dependent perivascular channels to promote efficient elimination of soluble proteins and metabolites from the central nervous system.

- (●) False
- ( ) True

13 | Multiple Choice - Single Answer | ✔ | 0.25 | - | Hide Answer

Cochlea in the ear is for both hearing and maintenance of body balance.

- (●) False
- ( ) True

14	Multiple Choice - Single Answer	✖	-0.06	-	Hide Answer

T lymphocytes remain in the bone marrow to mature while B lymphocytes travel to the thymus.

- False
- True

Section - 4

Marks per question : 0.5 | **Marks Scored : 5.0** | Negative marks per question : 25%

Q No.	Q. Type	Status	Marks	Comment	
1	Multiple Choice - Single Answer	✔	0.5	-	Hide Answer

_____ is a resilient and smooth elastic tissue and rubber-like padding that covers and protects the joints between bones, the rib cage, intervertebral discs, the ear, and the nose.

- Cartilage
- Tendon
- Bursa
- Ligament

2	Multiple Choice - Single Answer	✔	0.5	-	Hide Answer

Which one of the following glands secretes the aqueous layer of the tear film?

- Bowman's
- Submandibular
- Parotid
- Lacrimal

3	Multiple Choice - Single Answer	✔	0.5	-	Hide Answer

Which of the following muscles are voluntary in nature?

- Cardiac
- Smooth

All of these

Skeletal

4	Multiple Choice - Single Answer	✔	0.5	-	Hide Answer

Which of these is completely an avascular tissue of the eye?

Choroid

Retina

Sclera

Cornea

5	Multiple Choice - Single Answer	✔	0.5	-	Hide Answer

Identify the sequence in which the three bones that amplify sound are arranged in the inner ear (sequence from tympanic membrane to oval window).

Stapes→Incus→Malleus

Incus→Malleus→Stapes

Malleus→Incus→Stapes

Malleus→Stapes→Incus

6	Multiple Choice - Single Answer	✔	0.5	-	Hide Answer

The _____ are air-filled cavities in the skull near the nasal passages and there are four pairs of it which are all layered with mucous membrane.

Sinuses

Septum

Olfactory epithelium

Nostrils

7	Multiple Choice - Single Answer	✔	0.5	-	Hide Answer

The _____ plate separates nasal cavity and cranial cavity.

- Cribriform
- Circumvallate
- Fungiform
- Filliform

8 | Multiple Choice - Single Answer | ✔ | 0.5 | - | Hide Answer

Which protein/pigment is present in variable amounts in the iris of eye which gives either brown, hazel, green, gray, or blue color to the iris?

- Crystallin
- Melatonin
- Melanin
- Keratin

9 | Multiple Choice - Single Answer | ✔ | 0.5 | - | Hide Answer

Which one of the following is NOT a part of brainstem?

- Midbrain
- Thalamus
- Medulla oblongota
- Pons

10 | Multiple Choice - Single Answer | ⚠ | 0.0 | - | Hide Answer

Which one of the below nerves carries the "spicy" signals to the brain?

- Glossopharyngeal
- Facial
- Vagus
- Trigeminal

11 | Multiple Choice - Single Answer | ✔ | 0.5 | - | Hide Answer

Which one of the following is not a structural component of a neuron?

- ○ Dendrite
- ○ Axon
- ○ Soma
- ◉ Macula

Section - 5

Marks per question : 1.0 | **Marks Scored : 2.75** | Negative marks per question : 25%

Q No.	Q. Type	Status	Marks	Comment	
1	Multiple Choice - Multiple Answers	✔	1.0	-	Hide Answer

Which of the following tastes involves activation of G-protein coupled receptors or its variant?

- ☐ Sour
- ☐ Salty
- ☑ Umami
- ☑ Sweet
- ☑ Bitter

2	Multiple Choice - Multiple Answers	✔	1.0	-	Hide Answer

Which of the following are components/parts of the immune system?

- ☑ Bone marrow
- ☑ Thymus
- ☐ Alveoli
- ☐ Nephron
- ☑ Spleen

3	Multiple Choice - Multiple Answers	✔	1.0	-	Hide Answer

Which of the following statements are CORRECT about blind spot in the eye?

- ☑ entry point for the major blood vessels that supply the retina
- ☑ contains no photoreceptors cells

- [ ] region with the greatest resolution
- [ ] contains fovea centralis
- [x] represents the beginning of the optic nerve

4	Multiple Choice - Multiple Answers	✖	-0.25	-	Hide Answer

Which of the following statements are TRUE about cerebrospinal fluid (CSF)?

- [ ] It is present only in the brain and not in the spinal cord
- [ ] Lack of CSF in brain results in Alzheimer's disease
- [x] It acts as a shock absorber
- [ ] It also helps in removing the waste products from the Central Nervous System
- [x] It reduces the weight of brain and spinal cord by creating buoyancy