dr.saeed

31. The oncogene erb-2 (also called her2-neu) encodes a:
growth factor
growth factor receptor**********
signal transduction protein
transcription factor
Non of the above

32. The “proof reading” ability of DNA polymerase is due to:
(answer) (a) 3’ – 5’ exonuclease activity
(b) 5’ – 3’ exonuclease activity (c) 3’ – 5’ polymerase activity (d) 5’ – 3’ polymerase activity (e) NONE of the above

33. sub unit from arrow : RXR
34. proapoptotic that forms channels : bak
35. broad CDKI : p21
36. thymine dimers: nucleotide excision repair
37. pcr units: dna primer aw eshi haik
38. cortisol receptor blocked: post-translational level
39.HRE binds to: DNA binding domain
40. (The genetic loci that are most recently used for DNA fingerprinting are: (a) VNTRs (b) STRs ***(c) snRNPs (d) SNP (e) RISC
41. The human genome: none of the above

42. Ras: signal transduction proto-oncogenet
43 . metastasis due to detachment , which mutated protein? Cadherin
44. find which wont produce a frame shift: kan il jawab a triplet w betkoon a multiple of 3 its position
45.wrong about miRNA: only one mRNA can be degraded aw eshi haik (e)
46. something about APC: i think ino cloncal expansion

decreases chance of new mutations w hay ghalat
47.operons: poly cyistornic mRNA produced
48: uses of DNA chips: body fluid infections (false)
50 question deleted about iron

---

(1) The glycosidic bond that exists in nucleosides is between:
(a) 3' carbon of sugar and N9 of adenine
(b) 1' carbon of sugar and N1 of guanine
(c) 5' carbon of sugar and N1 of cytosine
(d) 1' carbon of sugar and N9 of guanine
(e) 5' carbon of sugar and N1 of thymine
(2) The following molecule resembles:
(a) Guanosine monophosphate
(b) Cytidine monophosphate
(c) Adenosine monophosphate
(d) Deoxythymidine monophosphate
(e) Deoxyadenosine monophosphate
(3) One of the following is part of the basal transcriptional complex:
(a) Co-activator
(b) RNA polymerase
(c) Co-repressor
(d) Transactivator
(e) NONE of the above
(4) Which one of the following is less likely to have a DNA binding domain:
(a) Myc
(b) Glucocorticoid receptor
(c) Thyroid hormone receptor
(d) TATA binding protein
(e) RNA polymerase
(5) Which of the following is TRUE regarding AZT:
(a) Possesses a N3 group on carbon 5'
(b) Not phosphorylated by the normal cellular kinases
(c) Has the same affinity towards viral reverse transcriptase and

cellular polymerase
(d) It is a synthetic analog of a guanine nucleotide
(e) NONE of the above
(6) Which of the following is inhibited by the mushroom toxin α-amanitin:
(a) RNA polymerase I
(b) RNA polymerase II
(c) RNA polymerase III
(d) DNA polymerase
(e) DNA Helicase
(7) The "proof reading" ability of DNA polymerase is due to:
(a) 3' – 5' exonuclease activity
(b) 5' – 3' exonuclease activity
(c) 3' – 5' polymerase activity
(d) 5' – 3' polymerase activity
(e) NONE of the above
(8) Which of the following sequences can be cut by a restriction enzyme:
1 2 3 4 5
AATATTCGAGGATCATAAGGCTATTAGGCAAGCTTAGGC
GAGCGAGTCGGACTCAAATCGAAG
(a) 1
(b) 2
(c) 3
(d) 4
(e) 5
(9) The polymerase enzyme responsible for mitochondrial DNA replication is:
(a) δ DNA polymerase
(b) DNA polymerase
(c) γ DNA polymerase
(d) β DNA polymerase
(e) DNA polymerase
(10) Which of the following is TRUE regarding the genetic code:
(a) Not degenerate
(b) Absolutely universal

(c) Ambiguous
(d) Non-overlapping
(e) NONE of the above
(11) Which of the following is a signal transduction tumor suppressor:
(a) fos
(b) pRb
(c) p53
(d) E-cadherin
(e) NF-1
(12) Herceptin (trastuzumab) is a recent drug (monoclonal antibody) used to treat certain types of breast cancer that are influenced by which of the following characteristics:
(a) BRCA 1 and BRCA 2 mutations
(b) HER2/NEU negative
(c) Overexpression of erb-b2
(d) Translocations
(e) NONE of the above
(13) The subunit indicated by the arrow is:
(a) GTPase
(b) GAP
(c) p53
(d) Rb
(e) E2F
(14) A characteristic of cancer cells is:
(a) Response to contact inhibition
(b) Response to inhibitory growth signals
(c) Resistant to senescence
(d) Undergo apoptosis readily
(e) Need stimulatory growth signals
(15) A sequence that is found at the 5' part of the 3' end of the promoter, just upstream to the transcription start point and is responsible for the binding of
(a) Operator
(b) Repressor
(c) Operon
(d) Inducer

(e) TATA box
(16) All of the following regarding gel electrophoresis are true EXCEPT:
(a) Can be used to separate DNA but not RNA
(b) Smaller molecules move faster than larger ones
(c) Molecules move towards the positive electrode
(d) The higher the density of the gel, the higher the resolution
(e) Agarose and polyacrylamide gels can be used
(17) One of the following is a Bcl-2 family ion channel forming member responsible for the formation of pores in the mitochondrial membrane needed to release cytochrome c out to the nucleus:
(a) Bcl-2
(b) Bcl-x
(c) Bok
(d) Bid
(e) NONE of the above
(18) The temperature needed by the thermostable DNA polymerase in PCR to synthesize a DNA strand is:
(a) 94 ^{o}C
(b) 61 ^{o}C
(c) 55 ^{o}C
(d) 72 ^{o}C
(e) 14 ^{o}C
(19) Which of the following types of rearrangements is most responsible for hematological malignancies:
(a) General recombination
(b) Retroviral reverse transcription
(c) Transposable elements
(d) Chromosomal translocations
(e) Chromosomal amplification
(20) Bulky adducts associated with DNA are repaired mainly by:
(a) Nucleotide excision repair
(b) Base excision repair
(c) Mismatch repair
(d) Transcription coupled repair
(e) Translation coupled repair

(21) All of the following regarding introns is true EXCEPT:
(a) Present only in eukaryotic cells
(b) Removed in the nucleus
(c) Spliced by snurps
(d) Intron shuffling results in the formation of proteins with similar functioning domains
(e) Possesses a 'AGGU' consensus sequence at its boundaries
(22) BRCA 1 and BRCA 2 repair genes are susceptible to mutations. Multiple forms of mutations have been associated with familial breast cancer in women. What is the best method to be used to diagnose these patients who have such a mutation:
(a) Southern blotting
(b) DNA sequencing
(c) Northern blotting
(d) Allele-specific PCR
(e) Western blotting
(23) Which of the following regarding primers in eukaryotic cells is TRUE:
(a) Made up of DNA subunits
(b) Consists of 200-300 nucleotides
(c) Formed by RNA primase
(d) Formed by the primase associated with DNA polymerase α
(e) Removed by DNase
(24) All of the following is true regarding mRNA synthesis in eukaryotes EXCEPT:
(a) Takes place in the nucleus
(b) Synthesis takes place on one strand, the template strand
(c) Carried out by RNA polymerase II
(d) Splicing is the function of snRNPs
(e) Synthesis starts at the ATG codon
(25) One of the following is a post-translational modification:
(a) 5' G-capping
(b) Polyadenylation
(c) Splicing
(d) Phosphorylation
(e) NONE of the above
(26) All of the following are true regarding polyadenylation

EXCEPT:
(a) Takes place in the nucleus
(b) 200-300 adenine residues are added to the 3' end of the mRNA
(c) Carried out by RNA polymerase II
(d) Is needed to stabilize the mRNA
(e) Adenine nucleotides are added after the polyadenylation sequence AAUAAA
(27) All of the following are true regarding p53 EXCEPT:
(a) It is a transcription factor
(b) It stimulates the cell cycle by inducing expression of p21 CKI
(c) Its function is lost is most cancers
(d) It stimulates GADD45 transcription
(e) It can induce apoptosis by activating Bax if DNA repair is not successful
(28) Which of the following is not involved in regulation at the translational level:
(a) Histone acetylase
(b) 5' mRNA loop
(c) 3' mRNA loop
(d) Eukaryotic initiation factors
(e) Ribosomes
(29) The genetic loci that are most recently used for DNA fingerprinting are:
(a) VNTRs
(b) STRs
(c) snRNPs
(d) SNP
(e) RISC
(30) Which of the following is true regarding the energy requirement during translation:
(a) 4 high energy bonds are needed (ATP and GTP are used)
(b) 1 ATP (cleaved to ADP) and 1 GTP (cleaved to GDP) are used
(c) 2 ATP are produced during the process
(d) No energy is needed

(e) NONE of the above
(31) Which of the following regarding aminoacyl tRNA synthetase is TRUE:
(a) Attaches an amino acid to the 5' end of a tRNA
(b) The bond it forms between an amino acid and tRNA is a peptide bond
(c) Each aminoacyl tRNA synthetase is specific for a certain amino acid
(d) No energy is needed
(e) NONE of the above
(32) What is the type of mutation involved when the codon CGG undergoes mutation to become AGG:
(a) Missense mutation
(b) Silent mutation
(c) Frame-shift mutation
(d) Nonsense mutation
(e) NONE of the above
(33) The process by which different mature mRNAs are produced after transcription is called:
(a) RNA editing
(b) Capping
(c) RNA remodeling
(d) Polyadenylation
(e) Conjugation
(34) All of the following regarding telomeres is true EXCEPT:
(a) Telomeres consist of a repeated sequence of TTAGGG
(b) Telomeres are shortened by each cycle of DNA replication
(c) Telomerase enzyme is a RNA dependant DNA polymerase
(d) A 3' overhang on one strand develops due to the incapability of the primase to lay down a primer at the end of the chromosome
(e) Telomerase enzyme lengthens the short strand resulting in no overhangs at all
(35) Spinal muscular atrophy (SMA) is an incurable autosomal recessive disease caused by a genetic defect in the SMN1 gene where a deletion mutation takes place. What is the best method to be used in order to detect this mutation:

(a) Southern blotting
(b) Northern blotting
(c) Western blotting
(d) PCR and electrophoresis
(e) DNA microarrays

(36) A severe and serious disease known as familial adenomatous polyposis (FAP) is caused by a mutation in:
(a) Mismatch repair genes
(b) β-catenin
(c) APC
(d) NF-1
(e) p53

(37) Which of the following is able to integrate a specific gene into a host cell:
(a) Adenoviral vectors
(b) Retroviral vectors
(c) Liposomes
(d) Plasmids
(e) Cosmids

(38) A DNA microarray has been performed for 2 different cells. RNA obtained from those two cells was allowed to hybridize with the DNA chip. What does the dark spot (pointed arrow) indicate about the oncogene expression in cells A and B:
(a) Oncogene is expressed more in cell A
(b) Oncogene is expressed more in cell B
(c) Equal amounts of oncogene expression in both cells
(d) Neither cells express the oncogene
(e) NONE of the above

(39) Which of the following regarding the promoter region is TRUE:
(a) Located downstream the first transcription site
(b) Many genes share the same promoter
(c) A promoter can be activated by more than one inducing transcription factor
(d) TATA box sequences are the least conserved sequences
(e) NONE of the above

(40) Ras is considered a:
(a) Growth factor proto-oncoprotein
(b) Growth factor receptor proto-oncoprotein
(c) Signal transduction proto-oncoprotein
(d) Transcription factor proto-oncoprotein
(e) NONE of the above

MARKSCHEME

1. D
2. D
3. B
4. E
5. E
6. B
7. A
8. C
9. C
10. D
11. E
12. C
13. B
14. C
15. A
16. A
17. C
18. D
19. D
20. A
21. D
22. B
23. D
24. E*
25. D
26. C
27. B
28. A
29. B
30. A

31. C
32. B
33. A
34. E
35. D
36. C
37. B
38. D
39.C
40.C

---

the experiment of the drosophila legs (legs emerging from its head): 1-cell proliferation 2-cell differentiation 3-cell transformation 4-apoptosis in the experiment of hershey & chase , they took advantage from one of the following """ this is not the way the question was """ 1- bacterial cells can get incontact to each others 2- differential radioactive labeling of both of DNA & Proteins 3- something about bacteriophages ... after meiosis I, the primary spermatocytes have: 1- 23 chromosome & 46 chromatid 2- 46 chromosome & 92 chromatid 3- 23 chromosome & .... one of these methods is used for the detection of DNA sequence and the bases appear in one lane: 1- radioactive labeled dideoxynucleotid 2- florescent labeled dideoxynucleotid 3- both 1 and 2 can be used 4- -radioactive labeled deoxynucleotid 5- florescent labeled deoxynucleotid a diagram showing fragments of DNA ,,, RFLP was used ,, which of the following might be a carrier state of the disease : the answer is 2 bands one intermediate length and the other small length
Lejan2009/2010
A question about Repititive DNA sequences, which one is true : A) LINE contain ALu sequence. B) VNTR are minisatellite .... c) STR are dispersed A question showing a figure for a replication bubble , and asks to determine the lagging strand The enzyme that is responsible for unwinding in prokaryotes : A)

RNA polymerase b) general transcription factor a figure that shows a termination sequence "hair pin " , and asking where we can find it : occurs when the detachment happens between the DNA template & the RNA polymerase About The proofreading mechanism , which one is correct : A) 3'-5' exonuclease B) 5'-3' endonuclease C) 3'-5' exonuclease which of the following is NOT true about sigma subunit in the RNA polymerase : 1- not required for the basic catalytic activity of the enzyme 2- dissociate after a while of starting transcription 3- degraded immediately after dissociating 4- binds to specific sequences on the promoter one of the following is true about telomerase: 1- inactivation of telomerase contributes for the extended lifespan of cancer cells. 2- telomerase extends the 5' end of the parental DNA template 3- it uses DNA template 4- it extends the daughter DNA strand to become longer than the parental DNA
Lejan2009/2010
how the microRNA function in inhibiting translation?? 1- inhibite binding of RNA polymerase 2- degrade mRNA. 3- addition of stop codon which of the following can't be detected directly by the PCR : 1- detection of bacterial or viral sequences(or infection) 2- cloning of specific DNA sequence 3- DNA sequencing 4- can detect the lenght
DNA microarray is used for the detection of all except : the level of translation a question about TF II H all are true except : 1- It is a helicase 2- It is a general transcription factor 3- It is specific to RNA polymerase II 4- It is a part of the transcription initiation complex A question about lac operon regulation?! A long question about how can u detect a mutation in an intron by using CG probe : A) comparitive genomic hybridization B) western blotting C) northen blotting D) southern blotting question about Chromatin Acetylation: 1_ Histone specific. 2_ enzymatic / non enzymatic reversible 3_ common in actively transcribed genes. 4_ protein-Coding region .... •
Lejan2009/2010
how to make imperfect hybridization? 1- lowering salt concentration 2- Increasing the length
an image of atRNA having the anticodon sequence (3'- GAC

-5') (the 3' -5' was concluded from the figure), what is the amino acid carried by it? the answer >>Asp -when an antibiotic was used to block translation in a prokaryote, the resulting protein was a dipeptide, what step was inhibited/blocked by this antibiotic? 1- initiation 2- trasnlocation
a tRNA that is destined to bear the AA Cysteine was charged improperly by another AA whuch is Alanine. upon translation, what event of the following could take place? the answer was: the Cysteine anticodon in tRNA will base pair with corresponding codon in mRNA but it will incorporate Alanine instead of Cysteine
a characteristic that indicate a prokaryotes: the answer was>> the amino acid chain starts with N-formlymethionine
-In the presence of Heme, Protein (globin) synthesis is upregulated/stimulated by: 1- Dephosphorylation of eIF-2 2- increase the rate of hydrolysis of the GTP-elf2 complex
Constitutive expression of the lac operon in the absencehow to make imperfect hybridization? 1- lowering salt concentration 2- Increasing the length
an image of atRNA having the anticodon sequence (3'- GAC
-5') (the 3' -5' was concluded from the figure), what is the amino acid carried by it? the answer >>Asp -when an antibiotic was used to block translation in a prokaryote, the resulting protein was a dipeptide, what step was inhibited/blocked by this antibiotic? 1- initiation 2- trasnlocation
a tRNA that is destined to bear the AA Cysteine was charged improperly by another AA whuch is Alanine. upon translation, what event of the following could take place? the answer was: the Cysteine anticodon in tRNA will base pair with corresponding codon in mRNA but it will incorporate Alanine instead of Cysteine
a characteristic that indicate a prokaryotes: the answer was>> the amino acid chain starts with N-formlymethionine
-In the presence of Heme, Protein (globin) synthesis is upregulated/stimulated by: 1- Dephosphorylation of eIF-2 2- increase the rate of hydrolysis of the GTP-elf2 complex
Constitutive expression of the lac operon in the abscence of

lactose could happen by:

Moving of the operator upstream to the promoter
one of the following is true about the depicted polyribosome structure: the answer was that a ribosome closest to the 3' end of the mRNA bears a polyptide chain that is longer from that in a one nearer to the 5' end ((which was not obvious in the one we encounterd in the exam))
a trsncription factor has a testosterone zinc finger domain, a domain that binds the hormone estrogen & an activation domain for progesteron, on of the following happens: the answer was that testosterone zinc finger domain binds DNA then it was something related to estrogen binding...!
what does this abbreviation mean 11p15.5 answer>>on region 15.5 of the short arm of chromosome 11
in an experiment similar to that of griffth but with different naming and different observations, give what match the observations (he wants the transforming factor) answer>>> the transforming factor is a secretory protein that can transform live or killed non-pathogenic strains why>> protein...as when we used a protease the non-pathogenic strain did not transform. Lejan2009/2010
secretory...as both live and killed pathogenic
secretory...as both live and killed pathogenic strains caused the transformation, if it where to be intracellular protein then the live pathogenic would not function
to make cDNA library and produce insulin form E.coli strains optained, which of the following is not used in the process: a- RNA polymerase II b- antibiotic c... d... e...
in gel electrophoresis, which of the following is not true: a- migration in gel not only depend on size but on charge of DNA fragment as well b- a specific prope must be used to visualize the bands c- you can see the bands under the normal light e....
a question asking about the sequence of the mRNA for the given amino acid polypeptide chain: >>>5'-AUG....UAG-3' (only on of the options match those criteria of the mRNA)
about meiosis in males and females, which is true: a-

commenses in females at puberty, and at early embryonic life in males. b- primary oocyte take along time to completely finish MITOSIS. c- the products are always of equal size in both d- dictyotene is the fetal stage that is found in one of them but not the other. e-....

a plot of PCR, asking the sequence of the template DNA strand. method to answer>>> -read the plot from down upward....this is the new strand from 5' to 3' -in the question he didn't give a primer sequence...but if given put at the 5' end of the new

Lejan2009/2010

strand - to find the template match with the new strand, but remember to reverse the direction so the template is 5' to 3' ex) new strand 5'-GCTACGAA-3'....then template is 5'-TTCGTAGC-3'

all of the follwoing indicate the presence of a protein coding region near (or proximal) to it, except: a- termination signal. b- enhancer c- gene on the homolgy of the same specie. (sth like this) d... e...

which of the following is able to catalyze the formation of the peptide bond in the process of translation

a- rRNA of the large ribosomal subunit b- protein of the large ribosomal subunit c- rRNA of the small ribosomal subunit d- protein of the small ribosomal subunit e-...