University of Palestine

Course No: BIPH 3225
Course Title: الهندسة الوراثية
Date: 19/4/2018
No. of Questions: (3)
Time: 1 hours
Using Calculator (No)

2 st Exam for 2nd Sem.
2017/2018
Total Grade:

Instructor Name: أ.روان المدهون
Student No.: _____
Student Name: _____
College Name: _____
Dep. / Specialist: _____
Using Dictionary (No)

Question One:

Choose the Correct answer from the followings:
Hint: put the answers in the below table (12 mark)

1. **Which of the following is correct about PCR and Gene cloning?**
   a) Both provides selective amplification of DNA sequence
   b) PCR is in-vivo while gene cloning in-vitro
   c) PCR is in-vitro process while Gene cloning in vivo
   d) a and c
   e) b and c
2. **All of the followings are true about the primer except**
   a) Two primers (Forward and Reverse) are required for each PCR reaction
   b) Primers are necessary for the selective amplification
   c) Primers attached to the Template at the extension stage of PCR
   d) Synthesized to be complementary with the desired gene
3. **Very long primer is not preferable because it**
   a) Increase the non-target amplification
   b) Decrease the stability of reaction
   c) Reduce the rate of reaction
   d) None of them
4. **When designing your primer yon must take in consideration**
   a) avoiding repetitive sequences
   b) avoiding internal complementary sequence
   c) avoiding too-long primers
   d) All of them
5. **Which of the followings are true about melting Temperature?**
   a) Determine by the CG and AT content of the primer
   b) As the GC content increase the melting temperature Decrease
   c) Used to estimate the extension temperature of PCR reaction
   d) All of the above
6. **Reverse Transcriptase PCR**
   a) Use mRNA as a Template
   b) Used to determine gene expression
   c) Used Oligo(dT)-primer for cDNA synthesis
   d) All of them.

7. DNA sequencing of PCR product mainly used to
a) Determine the size of the PCR product
b) to ensure that the 'correct' sequence of PCR product
c) to verify the homogeneity and Purity of product
d) none of them

8. Amplification of highly polymorphic DNA regions important for
a) Detection of new traits
b) Paternity testing and forensic Science
c) DNA fingerprinting
d) Forensics science only
e) b and c

9. DNA-Binding Dye
a) Used in Qualitative PCR
b) Highly specific in detection the PCR product
c) May over-estimate the actual amount of the product
d) based on complementary sequence

10. All the followings are true about Reporter probe in real time PCR except
a) Used to detect the amount of PCR product
b) Highly specific
c) may bind to non-target sequences
d) contain reporter dye and quencher compound

11. All of the followings are true about Taq DNA polymerase
a) Extracted form Thermus Aquatics Bacteria
b) Make the PCR automated process
c) Necessary in annealing step
d) Thermostable Enzyme

12. Too short primer
a) Cause non-specific binding.
b) Result in stable hybridization
c) Better than long primer
d) None of them

Q	1	2	3	4	5	6	7	8	9	10	11	12
Key												

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Question Two:

Mark True or false the following statements (8 marks)

1) Thin-walled tubes must be used in PCR to permit more rapid temperature changes than standard tubes or plates.
2) Denaturation and annealing temperatures are important for the specificity of the PCR reaction
3) The ideal annealing temperature must be high enough to enable hybridization between primer and template, but low enough to prevent mismatched hybrids from forming.
4) Nested PCR is a modified PCR in which two sets of primers (external and internal) are used
5) mRNA converted to cDNA using Reverse Transcriptase Enzyme and oligo-T-primer
6) Reporter Probe give fluorescent signal when reporter and quencher are very close together
7) DNA replication and PCR are similar in using helicase enzyme to denature dsDNA
8) In Real time PCR The more rapidly the threshold is reached, the greater the amount of DNA in the starting mixture.

Q	1	2	3	4	5	6	7	8
Key								

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Question Three:

Answer the followings Questions:

A. Describe briefly the three stages of PCR, their temperatures and functions (3marks)

1)
2)
3)

B. Mention The key requirements for the PCR (2 marks)

1) 3)
2) 4)

B. During Primer design it must <u>be long enough</u> for two reason. Mention them (2 marks)

1) 2)

C. Explain why Internal complementary sequence in primer design must be avoided (2 marks)

D. Explain why the two primers should be designed so that they have identical Melting Temperature. (1 mark)

E. Mention two uses of Real Time PCR (2 marks)

1)
2)

End of Questions
Good Luck