Enrollment No._____

**NAVRACHANA UNIVERSITY**
a UGC recognized University

**School:** School of Science
**Program/s:** Biomedical Science
**Year:** 4th **Semester:** VII
**Examination:** End Semester Examination
**Examination year:** December - 2022

**Course Code:** BM404 **Course Name:** Recombinant DNA technology and Genetic engineering
**Date:** 08/12/2022 **Total Marks:** 40
**Time:** 08:30 AM to 10:30AM **Total Pages:** 2

*Instructions:*

- *Write each answer on a new page*
- *Draw neat and well-labelled diagrams wherever required*
- ** COs = Course Outcome mapping # BTL=Bloom's Taxonomy Level mapping*

| Q. No. | Details | Marks | COs* | BTL# |
|---|---|---|---|---|
| Q.1 | **Choose the correct option**<br><br>1. _____is an example of type IIS restriction enzyme<br>a. BsmBI b. AluI<br>c. Sau3AI d. None of the above<br><br>2. _____s an example of endo nuclease in eukaryotes<br>a. RNases b. DNases<br>c. Ribozymes d. None of the above<br><br>3. Type II restriction enzymes have_____activity but does not have _____activity<br>a. Endonuclease, methyltransferase b. Endonuclease, ATPase<br>c. Endonuclease, GTPase d. None of the above<br><br>4. The EcoRI recognition sequence consists of __base pairs (bp) and is cut between the _____residues on each strand.<br>a. 6, adenine and cytosine b. 6, guanine and cytosine<br>c. 8, guanine and adenine d. None of the above<br><br>5. _____generate cohesive ends whereas _____generate blunt ends.<br>a. EcoR1, Alu1 b. Alu1, Sau3A1<br>c. BamH1,Sau3A1 d. None of the above<br><br>6. _____and_____are known as neoschizomers.<br>a. Sfo1, Bbe1 b. BamH1,Sau3A1<br>c. EcoR1, Alu1 d. None of the above<br><br>7. The megaprimer method of mutagenesis uses__ | 12 | CO1<br>CO2<br>CO3<br>CO4<br>CO5 | BTL1<br>BTL2<br>BTL3 |

a. Long chemically synthesized oligonucleotides as primer
b. PCR product as a primer
c. Linker/adaptor sequence as a primer
d. None of the above

8. _____is used for tracing/observing newly synthesized peptides in the phage display method.
a. 32P
b. protein specific antibodies
c. 35S
d. None of the above

9. In alpha complementation__sequence referred as donor and____as acceptor.
a. omega, alpha
b. alpha,omega
c. alpha and alpha prime
d. None of the above

10. pUC vector was modified from pBR322 to____
a. Increase number of cloning sites
b. Increase copy number
c. Increase gene size for carrying capacity
d. None of the above

11. _____vectors have highest foreign gene carrying capacity
a. COSMID
b. YAC
c. BAC
d. PHAGEMID

12. _____PCR method is utilized to derive unknown sequence information of cloned gene
a. Touch-down PCR
b. Hot-start PCR
c. Multiplex PCR
d. Inverse PCR

| | | | | |
|---|---|---|---|---|
| **Q.2** | **Answer the following in short.** **Any six**<br>1. What is the difference between type I and type II restriction enzymes?<br>2. Define vector. Enlist 4 key parameters for designing/selecting a vector.<br>3. What is the significance of adaptor and linker in cloning?<br>4. Provide a comparative between lambda-phage vector and pBR322 vector.<br>5. What are the key differences between genomic library and c-DNA library?<br>6. Explain the nomenclature of restriction enzymes using 2 suitable examples.<br>7. What is the significance of modified/hybrid vectors in R-DNA technology?<br>8. Explain primer extension method. | **12** | CO1<br>CO2<br>CO3<br>CO4<br>CO5 | BTL1<br>BTL2<br>BTL3 |
| **Q.3** | **Answer the following in detail.** **Any four**<br>1. Describe alpha-complementation process in detail.<br>2. Describe utility of mutagenesis in genetic engineering using a suitable example.<br>3. Explain hot-start PCR and Inversion PCR.<br>4. Explain the selection procedure for selection of recombinants.<br>5. Explain phage-display. What is its significance in genetic engineering?<br>6. Explain gene-manipulation in animals using suitable example. | **16** | CO1<br>CO2<br>CO3<br>CO4<br>CO5 | BTL1<br>BTL2<br>BTL3 |

**********End of Question Paper**********