

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

**CLASS: BTECH
BRANCH: BIOTECH**

**SEMESTER : V
SESSION : MO/2025**

SUBJECT: BE302 FUNCTIONAL GENOMICS AND RDNA TECHNOLOGY

TIME: 02 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
-

		CO	BL
Q.1(a)	Differentiate between forward genetics and reverse genetics approaches.	[2] 1	3
Q.1(b)	Critically analyze why RNA is considered both a genetic material and a catalyst.	[3] 4	2
Q.2(a)	Describe the mechanism of RNA interference and the role of Dicer and RISC complex.	[2] 1	3
Q.2(b)	Explain the biogenesis and function of miRNAs.	[3] 1	2
Q.3(a)	Explain the natural function of CRISPR-Cas systems in bacteria.	[2] 2	2
Q.3(b)	Compare the advantages and disadvantages of TALENs with CRISPR-Cas systems.	[3] 6	3
Q.4(a)	Classify restriction endonucleases with examples.	[2] 2	1
Q.4(b)	Explain the principle and applications of Southern, Northern, and Western blotting in identifying gene expression and protein function.	[3] 3	4
Q.5(a)	Discuss the roles of DNA ligase and alkaline phosphatase in recombinant DNA technology.	[2] 5	2
Q.5(b)	Describe the steps in preparation of genomic DNA and cDNA libraries. Compare their importance in functional genomics research.	[3] 3	3

:18/09/2025:M