

M.Sc. BOTANY
Second Semester (Repeat)
CELL & MOLECULAR BIOLOGY
(MSB – 202)

Duration: 3Hrs.

Full Marks: 70

Part-A (Objective) =20
Part-B (Descriptive) =50

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins.

Marks: 50

Answer any four from Question no. 2 to 8
Question no. 1 is compulsory.

1. What is Microscopy? Discuss the principles and working of Phase Contrast Microscope. (2+8=10)
2. What is Chloroplast? Discuss the structure origin and function of the Chloroplast. (2+8=10)
3. Describe the process of DNA replication. (10)
4. Why is RNA processing more common in eukaryotic cell? Discuss the RNA processing of eukaryotic pre-mRNA. (2+8=10)
5. Write note on autoradiographic evidence of semiconservative DNA replication. Discuss the process and mechanism of θ -DNA replication model. (2+8=10)
6. Discuss the process of protein synthesis in prokaryotes. (10)
7. What is attenuation? Discuss the trp operon of *E.coli*. (10)
8. Write notes on: (5+5=10)
 - a) RNA Polymerase
 - b) DNA double helix

M.Sc. BOTANY
Second Semester (Repeat)
CELL & MOLECULAR BIOLOGY
(MSB – 202)

Duration: 20 minutes

Marks – 20

(PART A - Objective Type)

I. Choose the correct answer:

1×20=20

- Nobel prize for synthesizing alanine tRNA gene *in vitro* from mononucleotide was given to:
 - R.W. Holley
 - H.J. Muller
 - R.A. Fisher
 - H.G. Khorana
- Which component of the DNA polymerase III involves in loading on DNA?
 - γ
 - β
 - α
 - None
- The rate of replication fork movement in prokaryote is:
 - 100 bp/sec
 - 200 bp/sec
 - 1000 bp/sec
 - None
- The limit of resolution (l) of any optical instrument (i.e eye or microscope) is given approximately by the Abbe's relationships:
 - Resolution = $\frac{\text{Wave length } (\lambda)}{\text{Numerical aperture } (n \sin \alpha)}$
 - Resolution = $\frac{\text{Wavelength } (\lambda)}{\text{Refractive index}}$
 - Magnification = resolution \times numerical aperture
 - Resolution = wavelength \times n sin nsina
- During sample preparation for TEM, the vapour of heavy metal is deposited on one side of the surface of the elevated particles; on the other side a shadow forms. This process of sample preparation is known as:
 - Freeze fracture
 - Tracers
 - Shadow casting
 - Negative staining
- In SEM, electrons that originate from much deeper within the sample (a few μm below the surface), and provide compositional information, but give lower resolution images are called:
 - Secondary electrons
 - X-rays
 - Backscattered electrons
 - None of the above
- Which type of modern microscope has an annular stop, an opaque disk with thin transparent ring?
 - Transmission electron microscopy
 - Fluorescence microscopy
 - Phase contrast microscopy
 - Scanning electron microscopy
- Long, flattened, sac like, unbranched tubules which remain arranged parallelly in bundles or stakes are called:
 - Vesicles
 - Tubules
 - Nissl bodies
 - Cisternae
- The plasma membrane of certain cells having extraneous coats around them are known as:
 - Selective permeable Plasma membrane
 - Semi permeable Plasma membrane
 - Dialysing Plasma membrane
 - Impermeable Plasma membrane
- Which of the following is a component of cell wall?
 - Cellulose
 - Pectin
 - Mineral deposits
 - All of the above
- Mitochondria were first observed by:
 - W. Flemming
 - Kolliker
 - Robert Brown
 - Karl Nagli
-RNA makes the structure of ribosome.
 - tRNA
 - mRNA
 - rRNA
 - All of the above



University of Science and Technology, Meghalaya

Date Stamp: _____

13. Template strand is also known as.....

- a) (+) strand
- b) (-) strand
- c) Both are correct
- d) None of the above

14. Sigma factor is a component of.....

- a) DNA ligase
- b) DNA polymerase
- c) RNA polymerase
- d) Endonuclease

15. Splicing protects RNA from:

- a) Replication
- b) Degradation
- c) Amplification
- d) Degeneration

16. Is the following statement true or false? 'Eukaryotic mRNA is transcribed by RNA polymerase II'.

- a) True
- b) False

17. Control of operon by attenuation can be found in:

- a) Lac operon
- b) Trp operon
- c) Ara operon
- d) All of them

18. The element which is not involved in an operon model:

- a) Eliminator
- b) Regulator
- c) Operator
- d) Promoter

19. The promoter sequence in eukaryote is:

- a) Pribnow box
- b) TTGACA box
- c) TATAAT box
- d) TATA box

20. The nitrogen isotopes that were used in Meselson-Stahl experiment demonstrating semiconservative replication were:

- a) N14, N14
- b) N15, N15
- c) N15, N14
- d) None

SESSION: 2016-17 COURSE _____ PAPER Code: _____ NAME OF THE PAPER: _____ SEMESTER _____																										
<u>Instructions to Candidates</u>		For Objective Type Questions																								
<ol style="list-style-type: none"> 1. This answer booklet has 4 pages. Please check before writing whether it is complete or in good condition. 2. Do not write your name anywhere in the answer booklet. 3. Write legibly on both sides of the paper 4. You may use some space for any rough notes or calculation on the answer booklet if you need. These rough notes, calculations must be scored out before submitting the answer booklet. 5. Do not bring any book or loose paper in the examination hall. 6. Do not tear any page from the answer booklet. 7. Do not write anything on the question paper or blotting paper or any pieces of paper while you are in the examination hall. 8. Any act of indiscipline or misbehavior in the examination hall will result in your expulsion. 9. No examinee is allowed to leave the examination hall until 30 minutes lapse after the commencement of the examination. 10. Additional answer sheet will be supplied after the main answer booklet is completed. 	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Page No.</th> <th style="width: 50%;">Marks</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr> <td align="right" colspan="2">Total</td> </tr> </tbody> </table>	Page No.	Marks																			Total		Session: 2016-17 Course _____ Roll No. _____ Enrollment No. _____ Semester _____ Name of the Paper _____ _____ Paper Code _____		
	Page No.	Marks																								
Total																										
<u>For Descriptive Type Questions</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Question No.</th> <th style="width: 50%;">Marks</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr> <td align="right" colspan="2">Total</td> </tr> <tr> <td align="right" colspan="2">Grand Total</td> </tr> </tbody> </table>	Question No.	Marks																			Total		Grand Total		
Question No.	Marks																									
Total																										
Grand Total																										

Scrutinizer's Signature

Examiner's Signature

Invigilator's Signature