

B.Sc. 3rd Semester (Honours) Examination, 2019-20**MICROBIOLOGY****Course ID : 32212****Course Code : SH/MCB-302-C-6**

Course Title: Cell Biology

Time: 1 Hour 15 Minutes**Full Marks: 25**

*The figures in the right hand side margin indicate full marks.
Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer *any five* questions of the following: 1×5=5
- Define cell signalling. Name two neurotransmitters.
 - Mention the role of D vitamins and calcium in prevention of cancer.
 - What is hopanoid? Where does it found?
 - Define Phagocytosis and Pinocytosis.
 - What is the role of P⁵³ gene in cell cycle control?
 - What is protein glycosylation?
 - Define apoptosis.
 - What is secondary lysosome?
2. Answer *any two* of the following: 5×2=10
- Describe the activation process of receptor tyrosine kinase. 5
 - Draw the ultrastructure of flagella of prokaryotes with labelled diagram. Mention the two functions of pili. 4+1=5
 - Describe the role of tumor suppressive and proto-oncogenes in cancer formation. 2½+2½=5
 - Write a short note on the role of endoplasmic reticulum with special emphasis and detoxification and protein transport.
3. Answer *any one* of the following: 10×1=10
- Describe the structure of nuclear pore complex with neat sketch and mention how it regulates the movement of bio-molecules between nucleus and cytoplasm. 6+4=10
 - Describe the fluid mosaic model of plasma membrane with neat sketch. Mention different functions of plasma membrane. 6+4=10
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SH-III/MCB-302-C-6(PR)/19

B.Sc. 3rd Semester (Honours) Practical Examination, 2019-20

MICROBIOLOGY

Course ID : 32222

Course Code : SH/MCB-302-C-6

Course Title: Cell Biology

Time: 2 Hours

Full Marks: 15

*The figures in the right hand side margin indicate full marks.
Candidates are required to give their answers in their own words
as far as practicable.*

1. Prepare slide and select any one mitotic stage following aceto-orcein squash technique. Draw, label and give your comment. 2+2+1+2=7
 2. Identify the supplied samples 'A' and 'B' mentioning specific characteristics
(Identification – ½, Characteristics – 1). 1½×2=3
 3. Laboratory Notebook 2
 4. Viva voce 3
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B.Sc. 3rd Semester (Honours) Practical Examination, 2019-20

MICROBIOLOGY

Course ID : 32222

Course Code : SH/MCB-302-C-6

Course Title: Cell Biology

Instruction to the Examiners.

1. Examiners are requested to supply prefixed root-tip material of *A-cepa* (onion).
 2. Examiners are requested to choose from the following specimen for specimen 'A' & 'B':
 - (i) Typical plant cell
 - (ii) Cancer cell
 - (iii) Typical animal cell
 - (iv) Diakinesis
 - (v) Metaphase-I
 - (vi) Anaphse-II
 3. All experimental works and drawings must be endorsed by one of the examiners.
 4. A key to the materials supplied questionwise and candidatewise should be submitted to the controller of examinations along with the answer-scripts.
 5. Marks should be entered in separate OMR sheets or as supplied by the University.
 6. Internal Examiners are requested to keep ready the materials, reagents and chemicals required for the experiments.
 7. Viva voce should be taken by both the examiners. Candidate should be called on one at a time for viva.
 8. Answer-scripts are to be sent to the controller of examinations after evaluation in sealed covers within a week from the date of completion of examination.
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B.Sc. 3rd Semester (Honours) Examination, 2019-20

MICROBIOLOGY

Course ID : 32213

Course Code : SH/MCB-303-C-7

Course Title: Molecular Biology

Time: 1 Hour 15 Minutes

Full Marks: 25

*The figures in the right hand side margin indicate full marks.
Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer *any five* of the following: 1×5=5
- (a) What is T_m ?
 - (b) State the function of DNA polymerase I.
 - (c) What are split genes?
 - (d) Name the enzyme involved in charging of tRNA.
 - (e) What is role of 23s r-RNA in translation?
 - (f) Write the significance of CAP in lactose operon.
 - (g) What is the function of histone deacetylase (HDAC)?
 - (h) Define alternative splicing.
2. Answer *any two* of the following: 5×2=10
- (a) Write a short note on DNA methylation. What is the significance of capping? 4+1=5
 - (b) Discuss in brief θ mode of DNA replication. What is the function of reverse DNA gyrase? 4+1=5
 - (c) Differentiate between Denaturation and Renaturation of nucleic acid. Add a short note on mitochondrial DNA. 2+3=5
 - (d) Describe the structure of B-DNA proposed by Watson & Crick. Distinguish it from z-DNA. 4+1=5
3. Answer *any one* from the following: 10×1=10
- (a) Describe the transcription process found in prokaryotic cell with neat sketch. What is consensus and conserve sequence? 7+3=10
 - (b) Discuss in detail about structure and regulation of tryptophan operon. Add a note on RNA interference. 2+4+4=10
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B.Sc. 3rd Semester (Honours) Practical Examination, 2019-20

MICROBIOLOGY

Course ID : 32223

Course Code : SH/MCB-303-C-7

Course Title: Molecular Biology

Time: 2 Hours

Full Marks: 15

*The figures in the right hand side margin indicate full marks.
Candidates are required to give their answers in their own words
as far as practicable.*

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| 1. Estimate the supplied specimen (A/B) by using colorimeter/UV spectrophotometer.
Standard curve prepn. – 2
Determine unknown conc. – 2
Comment – 2 | 6 |
| 2. Comment on photographic documents of 'C' & 'D'. | 2+2=4 |
| 3. Laboratory Records | 2 |
| 4. Viva voce | 3 |
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B.Sc. 3rd Semester (Honours) Practical Examination, 2019-20

MICROBIOLOGY

Course ID : 32223

Course Code : SH/MCB-303-C-7

Course Title: Molecular Biology

Instruction to the Examiners.

1. For question number (1) unknown solution of either standard DNA or RNA (only one to the each candidate) should be supplied along with readings for standard graph. Graph papers also be provided to the candidates. Unknown conc. of solution would be determined by examinee.
 2. Examiners are requested to choose from the following documents for Q No. 2
 - (i) Str. of t-RNA
 - (ii) θ replication
 - (iii) Rolling circle replication
 - (iv) Masselson's & Stahl experiment
 - (v) SDS-PAGE with DNA band
 - (vi) Gel with protein band
 3. Viva voce should be taken by the University appointed examiners only. Questions should be asked from the practical syllabus or related theory syllabus.
 4. The evaluated answer scripts and related papers with examinations should be sent to the University within 7 days from the completion of the examination.
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B.Sc. 3rd Semester (Honours) Examination, 2019-20

MICROBIOLOGY

Course ID : 32215

Course Code : SH/MCB-305-SEC-1

Course Title: Microbiological Analysis of Air & Water

Time: 2 Hours

Full Marks: 40

*The figures in the right hand side margin indicate full marks.
Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer *any five* of the following: 2×5=10
- (a) What is bio aerosol?
 - (b) What is the disadvantage of chlorination of drinking water?
 - (c) What is MPN test?
 - (d) Differentiate xenobiotics from recalcitrants.
 - (e) What is bio-remediation?
 - (f) Give example of one air borne bacterial and one viral disease.
 - (g) What do you mean by incineration?
 - (h) Which pH is favourable for fungal growth?
2. Answer *any four* of the following questions: 5×4=20
- (a) Why Escherichia coli is considered as indication of pollution? 3+2=5
 - (b) Describe how selective and differential medium facilitate the bacteriological analysis of water.
 - (c) Write down different methods of water purification.
 - (d) Write a short note about the role of UV light and HEPA filter to control microorganism.
 - (e) Name one water borne bacterial disease. How it can be controlled? 1+4=5
 - (f) What is allergen? Describe the role of aeromicroorganisms in food industry. 1+4=5
3. Answer *any one* of the following questions: 10×1=10
- (a) What is meant by sewage? Describe the different process of sewage treatment. 2+8=10
 - (b) Briefly describe different physical and chemical control measures of microbial diseases. 5+5=10
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B.Sc. 3rd Semester (Honours) Examination, 2019-20

MICROBIOLOGY

Course ID : 32211

Course Code : SH/MCB-301-C-5

Course Title: Microbial Physiology and Metabolism

Time: 1 Hour 15 Minutes

Full Marks: 25

*The figures in the right hand side margin indicate full marks.
Candidates are required to give their answers in their own words
as far as practicable.*

Answer *all* the questions.

1. Answer *any five* of the following: 1×5=5
 - (a) What is generation time?
 - (b) What is diauxic growth curve?
 - (c) What is microaerophilic bacteria? Give one example.
 - (d) What is meant by antiport?
 - (e) What is siderophore?
 - (f) What is dissimilatory nitrate reduction?
 - (g) What is methanogenesis? Give one example.
 - (h) Give one example each of oxygenic and anoxygenic photosynthetic bacteria.

 2. Answer *any two* of the following: 5×2=10
 - (a) With a diagram describe different phases of bacterial growth curve. What is meant by synchronous growth? 4+1=5
 - (b) What is the difference between passive and active transport? Describe the mechanism of facilitated diffusion. 2+3=5
 - (c) Describe the mechanism of homolactic fermentation. How it differs from heterolactic fermentation? 3+2=5
 - (d) Schematically describe photosynthetic carbon reduction cycle mentioning enzymes in each step.

 3. Answer *any one* of the following: 10×1=10
 - (a) Schematically represent and briefly narrate pentose phosphate pathway mentioning the enzymes involved in this pathway. What is the significance of this pathway? How it differs from EMP and ED pathway? 6+2+2=10
 - (b) Define chemolithotrophy. Classify aerobic chemolithotrophs into physiological groups with examples. Give an account of hydrogen oxidation by chemolithotrophic bacteria. 2+3+5=10
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B.Sc. 3rd Semester (Honours) Practical Examination, 2019-20

MICROBIOLOGY

Course ID : 32221

Course Code : SH/MCB-301-C-5

Course Title: Microbial Physiology and Metabolism

Time: 2 Hours in 1st Day

Full Marks: 15

1 Hour in 2nd Day

The figures in the right hand side margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer *all* the questions.

1. Determine the effect of temperature on growth of supplied *E. Coli.* culture. 7
(Procedure – 3, Result and interpretation – 4)
 2. Draw a growth curve of *E. Coli* showing log phase and stationary phase from the supplied data by turbidimetric method. 3
 3. Laboratory notebook 2
 4. Viva voce 3
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B.Sc. 3rd Semester (Honours) Practical Examination, 2019-20**MICROBIOLOGY****Course ID : 32221****Course Code : SH/MCB-301-C-5**

Course Title: Microbial Physiology and Metabolism

Instructions to the Examiners.

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|---|---|
| 1. Specimen — <i>E. Coli.</i> fresh culture | 7 |
| Procedure – 3 | |
| Result and interpretation – 4 | |
| Total | 7 |
2. Examiners are requested to supply OD values for the preparation by growth curve.
3. Laboratory notebook 2
Credit should be given to those candidates who have regular signature of the teacher in their practical notebook.
4. Viva voce 3
Minimum 5 questions to be asked within the limit of syllabus.

General Instructions

1. Twenty (20) examiners should be examined in a batch.
 2. Working out materials should be given in accordance with practical syllabus.
 3. Key to the materials supplied should be submitted along with the examined answer-scripts.
 4. Full name, Specimen signature and address (with mobile/Tel. No) of examiners (both internal and external) should be given in the 'key' submitted.
 5. Examined answer-scripts and 'key' should be semi-directly to the Controller of Examinations section within 07 days after completion of examination.
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