Mahatma Gandhi University
Of
Medical Sciences & Technology, Jaipur

Syllabus
B.Sc. Clinical Embryology

(3Years Degree Course)

Edition 2020-21

Notice

1. Amendments made by the University in Rules/ Regulations of the courses shall automatically apply.

2. The University reserves the right to make changes in the syllabus/ books/ guidelines, fee-structure or any other information at any time without prior notice. The decision of the University shall be binding on all.

3. The jurisdiction of all court cases shall be Jaipur Bench of Hon'ble Rajasthan High Court only.

SYLLABUS

B.Sc. Clinical Embryology (CODE)

(3 Years Degree Course)

Rules & Regulations

1. **TITLE OF THE COURSE**
   The title of the course shall be **"**B.Sc. Clinical Embryology".

2. **DURATION OF COURSE/TRAINING**
   The course shall be of three years duration from the date of commencement of academic session

3. **MEDIUM OF INSTRUCTION**
   English shall be the medium of instruction.

4. **ELIGIBILITY FOR ADMISSION**:

   - For admission a candidate should have passed the 10+2 (Senior Secondary) Examination or its equivalent Examination Science stream i.e. Physics, Chemistry and Biology Subjects with 45% marks in the aggregate for General Category and 40% for SC/ST/OBC/MBC candidates or as per Govt. Guidelines from a recognized Board.
   - Candidate should have completed the minimum age of 17 years as on 31st December of the year of admission.

5. **CRITERIA FOR ADMISSION**

   Selection shall be done by an Admission Board of the University strictly on merit. It will consist of two-step process –Written Entrance Examination followed by Counseling/Personal Interview (PI).

6. **RESERVATION POLICY**

   Reservation shall be applicable as per policy of the State Government.

7. **ENROLMENT**

   Every candidate who is admitted to the Course in Mahatma Gandhi Medical College shall be required to get himself/herself enrolled with the Mahatma Gandhi University of Medical Sciences & Technology after paying the prescribed eligibility and enrolment fees.

   A candidate shall deposit enrolment fees along with tuition fees at the time of his/her admission to the course. Such a candidate who fails to submit, through the college Principal, duly filled enrolment form along with original documents including migration certificate required for enrolment within two months of his/her admission or up to November 30 of the year of admission whichever is later, he/she will have to pay late fee prescribed by the University.

8. **MIGRATION RULES**

   - No student, once admitted to the course and enrolled by the University, will be permitted to migrate to any other Course/ University.
   - No student will be admitted to the Course on migration from any other Course/ University.

9. **ATTENDANCE**

   Minimum 75% attendance in each year, both for theory and practical classes separately. Student with deficient attendance will not be permitted to appear in University examination.

10. **CONDUCTION OF THE UNIVERSITY EXAMINATION:**
    University examination shall be conducted twice in a year; that is Main and Supplementary Examination. Supplementary examination shall be conducted after 2-4 months of the main examination.

11. SCHEME OF EXAMINATION

i. Theory

(a) Each Theory paper examination shall be of 3 hours duration and of maximum marks **70**.

(b) Internal assessment shall be of **30** marks for each Theory Paper.

Theory Papers	Theory		Paper Set & Evaluated	
	Total Marks	Pass Marks	No. of Internal Paper Setters	No. of External Paper Setters
Ist Year: Three Theory Papers	300	150	3	-
IInd Year: Three Theory Papers	300	150	3	-
IIIrd Year: Three Theory Papers	300	150	2	1

(c) For the First and Second year examinations – these respective above theory papers shall be set by the Internal Examiners covering their respective areas of syllabus. For each question paper there shall be a separate Internal Examiner. The answer books shall be evaluated by the concerned Internal Examiners (Papers Setters).

(d) In Third (Final) Year examination, one of the papers shall be set and evaluated by an External Examiner. In other words, one of the Internal has to be substituted by the External Examiner. The External Examiner (Paper Setter) shall evaluate his/her paper.

(e) The Paper Setter shall set the questions within the prescribed course of study of the concerned paper. There will be a set pattern of question papers duly approved by Academic Council. Model question paper is annexed herewith.

(f) It is to be noted that the Internal and External Examiners of all the three years (First, Second and Third year) shall be appointed by the President of the University. This exercise shall be conducted through the office of the Controller of the Examinations of the University. The External Examiner of Third year shall also be appointed by the President out of the panel of names submitted by the Concerned Coordinator of the course through the Dean to the Controller of Examinations for appointment of Examiners by the President of the University.

(g) Passing Marks: A candidate will have to obtain at least 50% marks in each Theory paper including internal assessment to pass. This shall include the marks obtained in Theory paper of 70 marks and internal assessment for that paper of 30 marks.

ii. Practical and Viva-Voce Examination

(a) Each year there shall be practical and viva-voce examination of 100 marks. It shall consist of one University practical exam of 70 marks and internal assessment of 30 marks. It shall be conducted after the Theory examination is over. A candidate will have to obtain at least 50% marks in practical and viva-voce examination inclusive of internal assessment to pass.

(b) The pattern of practical examination shall be as follows –

B. Sc. Course	Practical		Practical Examiners
	Total Marks	Pass Marks	
First Year	100	50	Two Internal Examiner(s)
Second Year	100	50	Two Internal
Third Year	100	50	One Internal & One External Examiner

iii. Result

1. A candidate will have to obtain at least 50% marks separately in each Theory paper including internal assessment and a minimum of 50% marks in the practical examination inclusive of internal assessment for him to be declared pass.

2. A Candidate who has failed in theory paper/s will reappear in respective theory papers/s in supplementary examination.
3. Candidate who has failed in Practical examination only will reappear only in practical examination in Supplementary examination.

iv. Supplementary Examination

(a) Eligibility for the failed candidates to appear at the supplementary examination shall be as below –

i. Failed in Theory Paper(s) and failed in Practical – shall reappear in the respective failed Theory paper(s) and Practical examination.

ii. Failed in Theory paper/papers and passed in Practical examination – shall reappear only in the concerned failed Theory paper(s).

iii. Passed Theory papers but failed in Practical – shall reappear only in the Practical Examination.

(b) There shall be a supplementary examination within two months of the declaration of the result of the main examination. Internal assessment marks obtained in main examination in the concerned failed paper/papers/ practical shall be carried forward for working out the result of supplementary Theory paper(s) and or practical examination. Such candidate who has secured less than 50% marks in the internal assessment will be allowed to improve his internal assessment marks in the repeat supplementary internal assessment examination.

(c) Marks secured by the candidate in passed main examination/supplementary examination Theory paper(s) and/or practicals, as the case may be, will be carried forward for working out his result.

(d) **Result**:

i. A candidate obtaining at least 50% marks in the supplementary Theory paper(s) and 50% marks in the supplementary practical examination, as the case may be, shall be declared successful.
ii. A candidate who has failed in supplementary theory paper(s) examination shall have to reappear only in the failed theory paper(s) at the subsequent examination.
iii. A candidate who has failed in supplementary practical examination shall have to reappear both in theory (all papers) and practical at the next main examination.

v. Promotion to Second/Third Year

1. A candidate appeared in the University examination and failed in theory paper(s) /Practical examination shall be promoted to next year
2. A candidate will be allowed to appear for the Final (3^{rd}) year examination only when the backlog of all papers (theory and practical) of first year and second year exams is cleared
3. The student is required to complete the course within 6 years from the joining of the course

vi. Result - Division: Successful candidates will be categorized as under –

1.	Those, securing 50% and above but less than 60% in the aggregate marks of First, Second & Third year taken together	-	Pass
2	Those, securing 60% and above but less than 75% in the aggregate marks of First, Second & Third year taken together	-	Pass with I Division
3	Those, securing 75% and above in the aggregate marks of First, Second & Third year taken together	-	Pass with Honours

12. GRACE MARKS

1. A student who appears in the whole examination in first attempt and obtains the required minimum pass marks in the total aggregate of an examination but fails to obtain the minimum pass marks in one subject (in theory and / or practical as the case may be) will be awarded the grace marks up to a maximum of 05 marks according to the following scale, provided the candidate passes the examination by award of such grace marks:

Marks obtained by the candidate above the required minimum aggregate pass marks		**Grace marks can be given up to**
Up to 6 marks	-	02
Up to 12 marks	-	03
Up to 18 marks	-	04
19 marks and above	-	05

2. No grace marks would be awarded to a candidate who appears in part/ supplementary/remand examination. Non appearance of a candidate in any part of the examination on account of any reason will make him ineligible for grace marks.
3. A candidate who passes the examination after the award of grace marks in a paper/practical or the aggregate will be shown in the marks sheet to have passed the examination by grace. Grace marks will not be added to the marks obtained by a candidate from the examiners.
4. If a candidate passes the examination but misses First or Second Division by one mark as applicable to the Faculty, he will be given one mark in the paper in which he gets the least marks and also in the aggregate of the subject as well as the complete examination to upgrade his division and make him entitled for the first or second division, as the case may be. Indication of this up-gradation will be given in the tabulation register as well as in the marks sheet of the candidate.
5. Non appearance of a candidate in any part of the examination will make him ineligible for grace marks.
6. A candidate who is awarded grace marks in any subject to pass the examination will not be entitled for distinction in any subject.
7. The place of the candidate who is awarded given grace marks to pass the examination or given one mark for up-gradation of his division in the examination merit list will, however, be determined by the aggregate marks he secures from the examiners.

13. REVALUATION / SCRUTINY

Revaluation of answer book(s) of the B.Sc. Courses is permissible in not more than 25% of the theory papers within 15 days from the date of declaration of examination result on submission of his/her application on the prescribed form along with the requisite fees. Such answer book(s) shall be re-evaluated as per University rules. Revaluation of answer book(s) shall not be permitted for second attempt in any paper.

Scrutiny (re-totaling) of answer book(s) of the B.Sc. Courses is permissible within 15 days from the date of declaration of examination result on submission of his/her application on the prescribed form along with the requisite fees as per University Rules.

Permission for revaluation / scrutiny

1. In 1st Attempt – Revaluation shall be permitted in 25% of the appeared papers. Scrutiny shall be permitted for all the papers.
2. In 2nd Attempt – Only scrutiny shall be permitted in all the papers. Revaluation shall not be permitted.
3. Revaluation shall also be permitted in 25% of such papers in which a candidate appears for the 1st time irrespective of his attempt in the whole examination.

4. Candidates passing all the subjects of one examination at different times shall be issued their mark-sheets showing actual attempts taken by them in passing the particular examination.

5. For determining the attempt, following criteria shall be followed –

S. No.	Situation	Attempt in next examination	
1.	Candidate is detained in all subjects	His attempt in all the subjects in the next examination will be treated as	1st Attempt
2.	Candidate permitted in all subjects But did not appear in all permitted subjects	His attempt in the next examination will be treated as	1st Attempt
3.	Candidate is detained in one / few subjects Permitted for the rest of the subjects Appeared in permitted subjects	His attempt in the detained subject(s) in the next examination will be treated as	2nd Attempt
4.	Candidate is detained in one / few subjects Permitted in the rest of the subjects Did not appear in the permitted subjects	His attempt in the next examination In detained subject(s) will be treated as In permitted subject(s) will be treated as	1st Attempt
5.	Candidate permitted in all subjects But did not appear in few subjects	His attempt in the permitted subjects in the next examination will be treated as	2nd Attempt

Curriculum Outline

Distribution of Teaching hours

1st Year B.Sc. Clinical Embryology

Course Title	Hours
Basics of male and female reproduction	100
Hypothalamo-pituitary gonadal Axis	100
Physiology of Menstrual Cycle	100
Knowledge of oogenenesis, spermatogenesis	70
Fertilization	70
Implantation	70
Luteal phase – normal physiology and LPD	100
Early embryonic development	100
Different etiologies of infertility	90
Total Theory Hours	**800**
Practical	400
Total Hours :	**1200**

2nd Year B.Sc. Clinical Embryology

Course Title	Hours
Etiology and management of male infertility 1. Basic semen analysis and interpretation of results (50) 2. Different methods of semen preparation for IUI and ART (IVF, ICSI) (50) 3. Different techniques of surgical sperm retrieval (50) 4. Genetic aspects of male infertility (50)	200
Stimulation protocols (ovulation inducing agents, gonadotropins & role of GnRH analogues)	200
Factors influencing the results of ART – recurrent implantation failure : etiology and management	150
Understanding of third part reproduction – gamete and embryo donation.	150
ICMR guidelines and regulations	100
Total Theory Hours	**800**
Practical	400
Total Hours :	**1200**

3rd Year B.Sc. Clinical Embryology

Course Title	Hours
Embryology – • setting up of IVF laboratory, design and positioning of the equipments (100) • Knowledge of different culture media and disposables (100) • Quality control and quality assurance (100) • Basics of embryo culture (110) • Micromanipulation techniques (110) • Cryopreservation of gametes and embryos (130)	650
Basics of Pre-implantation Genetic Diagnosis/ Screening.	70
Theoretical aspects of human embryonic stem cells & their therapeutic advantage.	40
Ethical considerations in IVF and Newer Advances in ART	40
Total Theory Hours	**800**
Practical	400
Total Hours :	**1200**

SYLLABUS

B.Sc.- Clinical Embryology

(3 Years Degree Course)

Learning Objectives: At the end of the course, a student in Clinical Embryology shall be able to:

1) Demonstrate comprehensive knowledge and understanding of gross and microscopic structure of the human cell and its organelles.
2) Comprehend normal anatomy and physiology of the male and female reproductive system.
3) Demonstrate knowledge of basic and systemic embryology including human genetics, genetic inheritance, gene regulation, immunology and stem cell therapy.
4) Develop a basic understanding of biochemistry, endocrinology, and pharmacology.
5) Independently handle semen and its processing for both techniques – Intrauterine Insemination (IUI) and in – vitro fertilization (IVF).
6) Be acquainted with mouse anatomy and physiology 7) Should be also to identify and handle human oocyte in embryology laboratory
7) Competently handle human gametes in the scenario of IVF and ICSI.
8) Assess viability of embryos and their developmental competence with fair accuracy.
9) Cryopreserve human gametes and embryos, thaw them and subsequently develop them to transfer into the uterus.
10) Understand the basic concepts of embroyology.
11) Should be well versed setting up an IVF laboratory according to standards available and well versed in quality control measures.

First Year

Theory Paper :

Paper-I - Basics of male and female reproduction, Hypothalamo-pituitary gonadal Axis, Physiology of Menstrual Cycle

Paper-II - Knowledge of oogenenesis, spermatogenesis, Fertilization, Implantation

Paper-III - Luteal phase – normal physiology and LPD, Early embryonic development, Different etologies of infertility

Part-I : Paper-I -

1. Basics of male reproduction:
2. Basics of female reproduction
3. Hypothalamo-pituitary gonadal Axis:
4. Physiology of Menstrual Cycle

Part-I : Paper-II -

1. Knowledge of oogenenesis
2. Knowledge of spermatogenesis
3. Fertilization
4. Implantation

Part- I : Paper-III :

1. Luteal phase – normal physiology:
2. Luteal phase defect :
3. Early embryonic development
4. Different etologies of infertility

Second Year

Theory Papers :

Paper - I : Etiology and management of male infertility

Paper - II : Stimulation protocols, Factors influencing the results of ART

Paper - III : Understanding of third part reproduction – gamete and embryo donation, ICMR guidelines and regulations

Part-II : Paper - I : Etiology and management of male infertility

1. Basic semen analysis and interpretation of results
2. Different methods of semen preparation for IUI and ART (IVF, ICSI)
3. Different techniques of surgical sperm retrieval (PESA, TESA, TESE) – indications, contraindications and complications
4. Genetic aspects of male infertility

.**Part-II :Paper-II :**

1. Stimulation protocols (ovulation inducing agents, gonadotropins &
2. Role of GnRH analogues)
3. Factors influencing the results of ART – recurrent implantation failure : etiology and management

Part-II :Paper- III :

1. Understanding of third part reproduction – gamete and embryo donation
2. Synchronization of the donor and recipient in oocyte donation program hormonal manipulation
3. Legal, ethical and emotional aspects of gamete and embryo donation
4. Process of selection and counseling of potential oocyte and sperm donors
5. ICMR guidelines and regulations

Third Year

Theory Papers :

Paper- I : Embryology Lab setup, equipments and QC,QA

Paper- II : Basics of PGD/ PGS, Human Embryonic Stem Cells (theoretical aspects)

Paper- III :Ethical issues in IVF

Part-III :Paper- I :

1. **Embroyology** - setting up of IVF laboratory, design and positioning of the equipments
2. Knowledge of different culture media and disposables
3. Quality control and quality assurance
4. Basics of embryo culture
5. Micromanipulation techniques
6. Cryopreservation of gametes and embryos

Part-III :Paper-II :

1. Basics of PGD/ PGS
2. Theoretical aspects of Human Embryonic Stem Cells & their therapeutic advantage

Part-III :Paper-III :

1. Ethical considerations in IVF
2. Ethical consideration in third party reproduction

PRACTICAL:

- History taking, understanding the basics of human reproduction
- Relevant investigations and different protocols
- Hands on experience in Andrology & Biochemistry Laboratory
- Hands on experience in Animal Laboratory
- Introduction into the IVF laboratory
- Laboratory procedures – practicals from Ovum pick up to transfer
- The sperm sample – preparation methods
- In – Vitro Fertilization & ICSI
- Embryo Scoring
- Culture Conditions
- Equipments
- Microscopes
- Embryo transfer
- Cell Biopsy
- Cryopreservation programme & quality assurance
- Sperm freezing/thawing
- Oocyte freezing/thawing or vitrfication/warming
- Embryo freezing/thawing or vitrification/warming
- Ovarian freezing/thawing or vitrificaion/warming
- Testicular freezing/thawing
- Frozen Embryo Transfer
- Equipments
- Innovative techniques in human embryo viability assessment
- Risks in the IVF Laboratory

Method of Training:

The candidates shall have rotatary posting in Department of Obs & Gynae (MGMC)/ OT/ Embroyology lab attend all the undergraduate Theory and Practical Classes regularly.

Seminars & Journal Review Meetings:

Students should actively participate in departmental seminars

and journal reviews.

Periodical Assessment and Progress Report:

The students have to be assessed periodically by conducting written, practical and viva voce examination. The assessment should be based also on participation in seminars, journal review, and performance in the teaching and use of teaching aids and progress in dissertation work.

The assessment will be done by all the recognized P.G teachers of department and the progress records be maintained by the head of the department.

Books for Study

1. A – Z Encyclopedia on Infertility Sulochana Ganasheela 2005.
2. A Practical Guide to Setting Up an IVF Lab, Embryo Culture Systems and Running the Unit Alex C Varghese, Peter Sjoblom, K. Jayaprakasan, April 2013.
3. Oogenesis Giovanni Coticchio, David Albertini, Lucia De Santis December 2012.
4. Sperm Chromatin Biological & Clinical Applications in Male Infertility & Assisted Reproduction Nini, Armand; Agarwal, Ashok (Eds.) September2011.
5. Practical Manual of In Vitro Fertilization: Advanced Methods and Novel Devices Nagy, Zsolt Peter; Varghese, Alex C; Agarwal, Ashok (Eds) September2011.
6. Preservation of Human Oocytes Dr. Andrea Borini & Dr. Giovanni Coticchio December 2009.
7. Human Preimplantation Embryo Selection Kay Elder, Jacques Cohen February2008.
8. In Vitro Fertilization: A Practical Approach David K. Gardner February2008.
9. Textbook of Assisted Reproductive Techniques David K. Gardner, Ariel Weissman, Colin M. Howles, Zeev Shoham, 4th Edition.
10. A Textbook of in Vitro Fertilization and Assisted Reproduction: the Bourn Hall Guide to Clinical and Laboratory Practice Peter Brindsen 3rd Edition 2004.
11. Quality & Risk Management in the IVF Laboratory David Mortimer February 2008.
12. A Color Atlas for Human Assisted Reproduction: Laboratory & Clinical Insights (Hardcover) Pasquale Patrizio, Michael J Tucker, Vanessa Guelman August 2006.
13. The Developing Human: Clinically Oriented Embryology Keith L. Moore, 7th edition January 2003.
14. Principles and Practice of Assisted Reproductive Technology, Vol. 2, Lab. Aspects of IVF & Andrology, 2nd Edition - Kamini Rao.
15. Infertility Diagnosis, Management & IVF – Dr. Anil Dubey.

MODEL PAPER

B.Sc. Cl. Embryology.-I **Short Name**
Code

B.Sc. Clinical Embryology

Part-I (Main) Examination Month Year

Paper - I

Basics of male and female reproduction, Hypothalamo-pituitary gonadal Axis, Physiology of Menstrual Cycle

Time: Three Hours
Maximum Marks: 70

Students shall be allowed to take only one supplementary copy along with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answered at different places in the answer book
Draw diagrams wherever necessary

Attempt all questions

Q.1 Describe physiology of menstrual cycle. Write down causes and management of primary amenorrhoea. 15

Q.2 Write down the development and anatomy of male genital tract. Describe the role of different accessory glands. 15

Q.3 Long Answer Type

a) Pathophysiology of PCOS 10

b) Premature ovarian failure 10

Q.4 Short Notes (any 4 out of 6) 4x5=20

a) Describe development of ovary

b) Anatomy of fallopian tube

c) Hypogonadotropic hypogonadism

d) Germ cell aplasia

e) Poor ovarian reserve

f) Endometrial changes in menstrual cycle

MODEL PAPER

B.Sc. Cl. Embryology.-I **Short Name**
Code

B.Sc. Clinical Embryology

Part-I (Main) Examination Month Year

Paper - II
Knowledge of oogenenesis, spermatogenesis, Fertilization, Implantation

Time: Three Hours
Maximum Marks: 70

Students shall be allowed to take only one supplementary copy along with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answered at different places in the answer book
Draw diagrams wherever necessary

Attempt all questions

Q.1 Describe oogenesis with labelled diagram of mature oocyte. Write down the causes of premature ovarian failure and its management. 15

Q.2 Write down steps of implantation list down the causes of implantation failure and their assessment. 15

Q.3 Long Answer Type

a) Steps of fertilisation 10

b) 2 – cell, 2 - gonadotropin theory 10

Q.4 Short Notes (any 4 out of 6) 4x5=20

a) Causes of failed fertilization in IVF lab

b) Role of pinopodes

c) AMH

d) Physiology of spermato genesis

e) Explain with Labelled diagram of graffian follicle

f) Explain with Labelled diagram of mature sperm

MODEL PAPER

B.Sc. Cl. Embryology.-I **Short Name**
Code

B.Sc. Clinical Embryology

Part-I (Main) Examination Month Year

Paper - III

Luteal phase – normal physiology and LPD, Early embryonic development, Different etiologies of infertility

Time: Three Hours
Maximum Marks: 70

Students shall be allowed to take only one supplementary copy along with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answered at different places in the answer book
Draw diagrams wherever necessary

Attempt all questions

Q.1 Write down the physiology and consequences of luteal phase defect describe LPD in ART. 15

Q.2 Write down the causes of tubal infertility. Different methods of its evaluation and management. 15

Q.3 Long Answer Type

a) Luteal support in ART 10

b) Grading of D_3 and D_5 embryo 10

Q.4 Short Notes (any 4 out of 6) 4x5=20

a) Premature sanitisation

b) Grading of oocyte

c) Uterine factors causing infertility

d) Hypothyroidism and infertility

e) WHO classification of anovulation

f) Unexplained infertility

MODEL PAPER

B.Sc. Cl. Embryology.-II **Short Name**
Code

B.Sc. Clinical Embryology

Part-II (Main) Examination Month Year

Paper - I
Etiology and management of male infertility

Time: Three Hours
Maximum Marks: 70

Students shall be allowed to take only one supplementary copy along with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answered at different places in the answer book
Draw diagrams wherever necessary

Attempt all questions

Q.1 Write down the minimum standard for semen analysis (WHO 2010 criteria). Describe different methods of semen preparations for IUI and IVF. 15

Q.2 Write down the causes of Azoospermia. How will you investigate and treat azoospermia. 15

Q.3 Long Answer Type

a) Hypogonadotropic hypogonadisim in male 10

b) Hypergonadotropic hypoogonadism in male 10

Q.4 Short Notes (any 4 out of 6) 4x5=20

a) Retrograde ejaculation - causes and management

b) OAT syndrome

c) Varicocele and its role in OAS

d) Indications of IUI

e) Role of serotal Doppler in male infertility

f) Anejaculation

MODEL PAPER

B.Sc. Cl. Embryology.-II **Short Name**
Code

B.Sc. Clinical Embryology

Part-II (Main) Examination Month Year

Paper - II
Stimulation protocols, Factors influencing the results of ART

Time: Three Hours
Maximum Marks: 70

Students shall be allowed to take only one supplementary copy along with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answered at different places in the answer book
Draw diagrams wherever necessary

Attempt all questions

Q.1	Describe the different stimulation protocols of IVF, their advantages & disadvantages.	15
Q.2	What is OHSS? What are the different measures to prevent and manage OHSS.	15
Q.3	Long Answer Type	
	a) Role of gonadotropins in IUI	10
	b) Clomiphene resistance, its causes and management	10
Q.4	Short Notes (any 4 out of 6)	4x5=20
	a) Monitoring of IVF cycles	
	b) Minimal stimulation in IVF	
	c) Empty follicle syndrome	
	d) IVF and its management	
	e) Types of trigger in IVFs	
	f) Mechanism of action of letrozole and clomiphene citrate	

MODEL PAPER

B.Sc. Cl. Embryology.-II **Short Name**
Code

B.Sc. Clinical Embryology

Part-II (Main) Examination Month Year

Paper - III

Understanding of third part reproduction – gamete and embryo donation, ICMR guidelines and regulations

Time: Three Hours
Maximum Marks: 70

Students shall be allowed to take only one supplementary copy along with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answered at different places in the answer book
Draw diagrams wherever necessary

Attempt all questions

Q.1	Mention the process of selection and counselling of potential oocyte and sperm donor.	15
Q.2	Discuss the salient features of ART bill and National Registry (NARI).	15
Q.3	Long Answer Type	
	a) Preparation of FET cycle	10
	b) Compare and contrast vitrification and slow freezing	10
Q.4	Short Notes (any 4 out of 6)	4x5=20
	a) ICMR guidelines for oocyte donation	
	b) New surrogacy bill, 2019	
	c) Oocyte sharing	
	d) Quality management and quality assurance	
	e) Consent form for a donor sperm	
	f) Three indications for cryopreservation of embryos	

MODEL PAPER

B.Sc. Cl. Embryology.-III **Short Name**
Code

B.Sc. Clinical Embryology

Part-III (Main) Examination Month Year

Paper - I
Embryology Lab setup, equipments and QC, QA

Time: Three Hours
Maximum Marks: 70

Students shall be allowed to take only one supplementary copy along with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answered at different places in the answer book
Draw diagrams wherever necessary

Attempt all questions

Q.1 What are the minimum requirements for setting up of IVF laboratory. Describe the assented equipments in IVF labs. 15

Q.2 Write down daily, monthly and yearly measures to control infection in IVF lab. What are the different types of filter used in IVF lab? 15

Q.3 Long Answer Type

a) Components of culture media 10

b) Types of culture medias 10

Q.4 Short Notes (any 4 out of 6) 4x5=20

a) Sterilization of a embryo lab

b) Indication and steps of nitrification

c) LAH (Laser Assisted Hatching)

d) Quality control in IVF lab

e) Triple gas incubator

f) Vitrification

MODEL PAPER

B.Sc. Cl. Embryology.-III **Short Name**
Code

B.Sc. Clinical Embryology

Part-III (Main) Examination Month Year

Paper - II
Basics of PGD/ PGS, Human Embryonic Stem Cells (theoretical aspects)

Time: Three Hours
Maximum Marks: 70

Students shall be allowed to take only one supplementary copy along with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answered at different places in the answer book
Draw diagrams wherever necessary

Attempt all questions

Q.1 Enlist the indications of PGS. Write down the advantages and disadvantages of day 3 and day 5 embryo biopsy. 15

Q.2 Discuss the genetic factors in male infertility. How will you investigate and manage them? 15

Q.3 Long Answer Type

a) Role of stem cells in ART 10

b) How will you manage a case of recurrent implantation failure? 10

Q.4 Short Notes (any 4 out of 6) 4x5=20

a) Discuss role of ERA in RIF

b) ICSI

c) What do you understand by time lapse ET?

d) Advantages of embyroscope

e) Enumerate types of pre-implantation testing

f) Role of G. CSF in RIF

MODEL PAPER

B.Sc. Cl. Embryology.-III **Short Name**
Code

B.Sc. Clinical Embryology

Part-III (Main) Examination Month Year

Paper - III
Ethical issues in IVF and Newer Advances in ART

Time: Three Hours
Maximum Marks: 70

Students shall be allowed to take only one supplementary copy along with one main answer book. All the parts of one question should be answered at one place. Different parts of one question should not be answered at different places in the answer book
Draw diagrams wherever necessary

Attempt all questions

Q.1	What is third party reproduction. Detail the new surrogacy bill.	15
Q.2	ICMR guidelines for donor oocyte along with the different consent form.	15
Q.3	Long Answer Type	
	a) Role of stem cell	10
	b) Antenatal screening test	10
Q.4	Short Notes (any 4 out of 6)	4x5=20
	a) Embryoscope	
	b) ERA	
	c) IMSI	
	d) Epigenetics	
	e) Disadvantages of embryo biopsy	
	f) Types of ET catheter with their advantages and disadvantages	