

Time: 3 Hours

M.M. 70

*Note: All questions are compulsory. Make diagrams wherever required.***Q1. Long answer type questions. Attempt any three.**

(10x3=30)

- Describe the process of virus cultivation in cell cultures. What types of cell cultures are used, and how are they maintained to support viral replication.
- Describe viral zoonotic infection.
- Describe the laboratory diagnosis, structure and genome of the Hepatitis B virus.
- Discuss the laboratory methods used to diagnose *Candida albicans*.
- Describe the laboratory diagnosis of fungal culture.

Q2. Short answer type questions. Attempt any five.

(5x5=25)

- Describe the different types of interferons involved in antiviral defense.
- Differences between smallpox and chickenpox virus.
- Describe the primary modes of HIV transmission?
- Describe the primary purpose of viral vaccines.
- Write the Classification of Herpes virus.
- Write the Laboratory diagnosis of cryptococcosis.
- Describe the different types of Rubella infection.

Q3. Very short answer type questions. Attempt any five.

(1x5=5)

- Define Keratoconjunctivitis or shipyard eye.
- Write the name of protein coat surrounding a virus.
- Define cowpox virus
- Define Negri Bodies.
- Write the name of process by which viruses replicate inside host cells.
- What is the main purpose of a KOH mount in Microbiology?
- What is the full form of LPCB mount?

Q4. Multiple choice questions. Attempt all.

(1x10=10)

- What is the symmetry of capsid of adenoviruses?
 - Icosahedral
 - Helical
 - Complex
 - None of the above
- Which of the following stain can be used for Diagnosis of fungal infections?
 - Gram stain
 - LCB
 - Indian Ink
 - All of these
- Which of the following is the largest virus?
 - Smallpox virus
 - Parvovirus
 - Coronavirus
 - Adenovirus
- Which of the following viruses is bullet shaped?
 - Herpes virus
 - Variola virus
 - Rabies virus
 - Parvovirus
- All of the following are continuous cell lines except:
 - HeLa cell line
 - Chick embryo cell line
 - HEp-2 cell line
 - KB cell line
- Which of the following viruses was used for smallpox vaccinations?
 - Vaccinia virus
 - Variola virus
 - Cowpox virus
 - Tanpox virus
- What is the common name for human herpes virus 4?
 - Cytomegalovirus
 - Epstein-Barr virus
 - Varicella-zoster virus
 - Herpesvirus simiae
- Which of the following fungi is not a mold?
 - Aspergillus fumigatus
 - Rhizopus
 - Cryptococcus neoformans
 - Absidia
- Germ tube test is diagnostic for:
 - Candida albicans*
 - Candida glabrata*
 - Cryptococcus*
 - Candida*
- Which of the following fungi is/are dimorphic?
 - Paracoccidioides brasiliensis*
 - Coccidioides immitis*
 - Sporothrix schenckii*
 - All of the above.

Time: 3 Hours

M.M. 70

Note: All questions are compulsory. Make diagrams wherever required.

Q1. Long answer type questions. Attempt any three.

(10x3=30)

- Compare and contrast the clinical significance of ABO incompatibility and Rh incompatibility.
- Define compatibility testing and describe its purpose in transfusion medicine.
- Define Hemolytic Disease of the Newborn and describe its cause.
- How does quality assurance ensure the safety of blood products in transfusion services?
- What are the advantages of using gel cards over traditional tube testing in blood typing?

Q2. Short answer type questions. Attempt any five.

(5x5=25)

- What are donor selection and rejection criteria?
- What is blood genetics?
- How do preservatives and anticoagulants used in blood storage impact blood components?
- What are the different types of blood bags used for collecting and storing blood?
- What are the primary clinical indications for using cryoprecipitate in transfusion medicine?
- What are the primary clinical indications for using cryoprecipitate in transfusion medicine?
- Who discovered the ABO blood group system and what was its significance in transfusion medicine?

Q3. Very short answer type questions. Attempt any five.

(1x5=5)

- Explain the difference between Rh-positive and Rh-negative blood types.
- How often can a person donate whole blood?
- What is the specific gravity of PRBC and FFP?
- What are the difference between serum and plasma?
- Write about utilization of platelets concentrate.
- Which anticoagulant use in blood bank?
- What is Landsteiner low?

Q4. Multiple choice questions. Attempt all.

(1x10=10)

- Which antigen is responsible for determining the Rh factor in blood?
 - A antigen
 - B antigen
 - D antigen
 - H antigen
- How often can a person donate whole blood?
 - Every 2 months
 - Every 3 months
 - Every 4 months
 - Every 8 weeks
- Which of the following is an advantage of using the gel card method for blood grouping?
 - Faster results
 - Requires fewer reagents
 - No need for centrifugation
 - Higher sensitivity and specificity for detecting antibodies
- Which blood product is used to replace clotting factors in patients with hemophilia?
 - Plasma
 - Red blood cells
 - Platelets
 - Cryoprecipitate
- Which blood type is considered the universal recipient for red blood cells?
 - O-
 - AB+
 - A-
 - B+
- What is the purpose of using anti-A and anti-B antisera during blood typing?
 - To determine the Rh factor
 - To measure hemoglobin levels
 - To identify the blood type by detecting specific antigens
 - To identify white blood cell count
- How should cryoprecipitate be stored?
 - At room temperature
 - At 4°C
 - At -18°C or lower
 - At 37°C
- AHG is commonly used in which of the following?
 - Blood typing
 - Platelet function testing
 - Direct antiglobulin test (DAT)
 - Hemoglobin electrophoresis
- What type of antibodies does AHG react with in blood tests?
 - IgM antibodies
 - IgA antibodies
 - IgG antibodies
 - Both IgG and IgM antibodies
- Cryoprecipitate is primarily used to treat which of the following conditions?
 - Bleeding due to platelet dysfunction
 - Severe anemia
 - Coagulation factor deficiencies, especially fibrinogen
 - Low red blood cell count

18/12/24

Printing Pages :1

Paper Code: MMLT-M-302

C (SVSU:2024-25)

Enrollment No.																			
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M.Sc. Medical Laboratory Technology (MMLT)

IIIrd Semester 2nd Year

Subject: Clinical Microbiology

Subject Code: MMLT-M -302

Time: 3 Hours

M.M. 70

Note: All questions are compulsory. Make diagrams wherever required.

Q1. Long answer type questions. Attempt any three.

(10x3=30)

- Explain the steps involved in obtaining and preparing a sample for bacterial culture, and describe the importance of aseptic technique in clinical microbiology.
- Describe the clinical manifestations and risk factors for urinary tract infections and discuss the most common causative organisms.
- Explain the concept of nosocomial infections, their common sources in healthcare settings, and the microorganisms most frequently responsible for these infections.
- Explain the methods used for diagnosing wound infections, including culture techniques and molecular methods.
- Discuss the various bacterial pathogens that cause food poisoning, clinical manifestation and laboratory diagnosis.

Q2. Short answer type questions. Attempt any five.

(5x5=25)

- What is the purpose of stool culture in diagnosing diarrhea?
- Describe the primary bacterial cause of sore throat.
- What is atypical pneumonia, and which pathogen commonly causes it?
- Discuss the laboratory diagnosis of syphilis?
- Write the laboratory diagnosis of tubercular meningitis?
- List microorganisms responsible for Sexually transmitted diseases.
- Discuss the laboratory diagnosis of amoebic dysentery?

Q3. Very short answer type questions. Attempt any five.

(1x5=5)

- What is the term for frequent urination, a common symptom of UTI?
- What is the term for bacteria present in urine without symptoms of a UTI?
- Which bacterium is known to cause gas gangrene in wound infections?
- Which part of the respiratory tract is generally sterile?
- Which part of the urinary tract is affected in pyelonephritis?
- Name the bacterium responsible for cholera.
- What is the main symptom of amoebic dysentery aside from diarrhea?

Q4. Multiple choice questions. Attempt all.

(1x10=10)

- PUO is characterized by fever lasting more than:
i) 1 day ii) 1 week iii) 3 weeks iv) 6 months
- The most effective way to prevent nosocomial infections is:
i) Antibiotic use ii) Hand hygiene iii) Quarantine iv) Regular screenings.
- Which part of the body is normally sterile?
i) Skin ii) Intestine iii) Blood iv) Mouth
- Viral meningitis is often caused by:
i) E. coli ii) Enteroviruses iii) Streptococcus pneumonia iv) Mycobacterium tuberculosis.
- The most common causative organism of UTI is:
i) Klebsiella pneumonia ii) Escherichia coli iii) Pseudomonas aeruginosa iv) Proteus mirabilis
- Traveler's diarrhea is often caused by:
i) Pseudomonas aeruginosa ii) Escherichia coli iii) Mycobacterium tuberculosis iv) Clostridium difficile
- The most common cause of bacillary dysentery is:
i) Shigella ii) Salmonella iii) Campylobacter iv) Escherichia coli
- A common cause of food poisoning after consuming poultry is:
i) Salmonella ii) Streptococcus pneumonia iii) Vibrio cholera iv) Clostridium botulinum
- The term PUO stands for:
i) Pyrexia of unknown organism ii) Pyrexia of unknown origin
iii) Pyrexia of unique origin iv) Pyrexia of untreatable origin
- What color does E. coli produce on MacConkey agar?
i) Green ii) Pink iii) White iv) Yellow

Printing Pages :1

Paper Code: MMLT-H-302

A (SVSU:2024-25)

Enrollment No.															
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M.Sc. Medical Laboratory Technology (MMLT)

IIIrd Semester IIInd Year

Subject: Laboratory Management

Paper Code: MMLT-H-302

Time: 3:00 Hours

Max. Marks: 70

Q.I: Write long notes on any three.

(10x3=30)

- Write the Principle, instrumentation and Application of HPLC.
- Discuss quality control and quality assurance in Clinical Laboratory.
- Discuss about functional components of clinical laboratory. Give the diagrams if necessary.
- Describe the training process model in clinical laboratory? Discuss about methods of training.
- Write the Principle, instrumentation and Application of Thin Layer Chromatography (TLC).

Q.II: Write short notes on any five.

(5x5=25)

- Describe the Key features of HIS.
- Describe the Key elements of planning of a laboratory.
- Describe the fire safety in clinical laboratory.
- Describe the Laboratory budgeting.
- Write the principle and application of Spectrophotometry.
- Write notes on Electrophoresis.
- Write notes on Ion exchange Chromatography
- Describe centrifuge and its application.

Q.III: Write Very short notes on any five.

(1x5=05)

- What is LJ graph?
- Write the Westgard mandatory rules.
- Write the definition of Quality assurance.
- Write about preanalytical error.
- Write the definition of standard deviation.
- Write the full form of PASS.
- Write the name of three lab safety equipment.

Q.IV: Attempt any four multiple Choice Questions. Select the correct answer only.

(1x10=10)

- The destruction of all micro-organisms including spores is called:-
 - Sanitation
 - Antisepsis
 - Disinfection
 - Sterilization.
- Sample collection error is the:
 - Preamalytical error
 - Analytical error
 - Post analytical error
 - None of these
- Medical laboratory services are should be
 - Accurate
 - Reliable
 - Timely
 - All of these
- Bragg's law is used in the
 - TLC
 - X-ray differaction
 - Colorimeter
 - Flow cytometer
- Which of the following type of personal protective equipment (PPE) is frequently used?
 - Safety glasses
 - Gloves
 - Face Shields
 - All of the above.
- SDS-PAGE separates proteins on the basis of:
 - Isoelectric Point
 - Amino acid sequence
 - Sedimentation Coefficient.
 - Size.
- CD4 and CD8 cells are counted by
 - Spectrophotometer
 - Flow cytometer
 - HPLC
 - None of These
- The fire triangle composed with
 - O₂
 - Fuel
 - Heat
 - All of these
- The lab should be accredited with :-
 - CAP
 - NABL
 - ISO.
 - All of these
- Rationale of LIMS?
 - Hardware
 - Software
 - Procedure
 - All of the above.

M.M. 70

(10x3=30)

(5x5=25)

- i. Bacteria ii. Viruses iii. Fungi iv. Protozoa

[illegible]

Subject: Recent Advances in Hematology and Blood Banking

Time: 3 Hours

M.M. 70

Q1. Long answer type questions. Attempt any three.

(10x3=30)

- Write about automated tissue processor with its procedure and advantages.
- Explain about central and provisional drug control authority.
- Describe laser microtome with principle and working procedure.
- Explain about the principle and procedure of gel card technique.
- What is automated embedding station? Explore its advantages and disadvantages.

(5x5=25)

- Define the role and work of auto-stainer in histopathology lab.
- Explain about new generation microtome.
- Define BCM device in blood banking.
- Explain about regulation for cord blood banking.
- What is National Blood Transfusion Council?
- Define gel card techniques.
- Define automation use in pathology laboratory.

(1x5=5)

- What is capillary blood collection?
- Define Laboratory Safety.
- What do you know about the calibration?
- Define PRP.
- Role of tube sealer in blood bank.
- ELISA is stands for _____
- What is Cord blood?

(1x10=10)

- a. Which of the following is a key benefit of automation in hematology?
 - i. Reduced accuracy
 - ii. Increased manual intervention
 - iii. Faster sample processing
 - iv. Higher equipment cost
- b. What technology is commonly used in automated hematology analyzers to count and classify cells?
 - i. Microscopy
 - ii. Flow cytometry
 - iii. ELISA
 - iv. PCR
- c. Which parameter is NOT typically measured by automated hematology analyzers?
 - i. White blood cell count
 - ii. Platelet count
 - iii. Hemoglobin concentration
 - iv. Antibody titers
- d. What is the primary purpose of automated coagulation analyzers?
 - i. Blood glucose measurement
 - ii. Determining clotting times
 - iii. Measuring hematocrit levels
 - iv. Detecting infections
- e. Which test is NOT typically performed on an automated coagulation analyzer?
 - i. Prothrombin time (PT)
 - ii. Activated partial thromboplastin time (aPTT)
 - iii. Fibrinogen level
 - iv. Blood urea nitrogen (BUN)
- f. What is the standard anticoagulant used in ESR testing?
 - i. Heparin
 - ii. EDTA
 - iii. Sodium citrate
 - iv. Lithium heparin
- g. What is a limitation of automated ESR methods compared to traditional Westergren methods?
 - i. Lower speed
 - ii. Inability to detect abnormal samples
 - iii. Higher initial cost of equipment
 - iv. Lack of reproducibility
- h. What is the ideal time frame for delivering blood samples for coagulation testing?
 - i. Within 4–6 hours
 - ii. Within 1 hour
 - iii. Within 24 hours
 - iv. No time limit applies
- i. What is the most common vein used for blood collection in adults?
 - i. Femoral vein
 - ii. Radial vein
 - iii. Cephalic vein
 - iv. Median cubital vein
- j. What is the primary purpose of laboratory informatics?
 - i. Perform manual calculations
 - ii. Manage laboratory data efficiently
 - iii. Replace laboratory personnel
 - iv. Conduct patient diagnosis

23/12/24

Printing Pages :1

Paper Code: MMLT-M/H-304

A

(SVSU:2024-25/R)

Enrollment No.											
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M.Sc. Medical Laboratory Technology (MMLT) 3rd Semester II Year Examination

Subject Code: MMLT-M/H-304

Subject Name: Research Methodology

[Time : 03:00 Hours]

[Max. Marks : 70]

Note : 1. Attempt all the questions as per given instructions.

1. Multiple Choice Questions (MCQs)

[01×15=15]

I Which of the following statements is correct?

- (A) Objectives of research are stated in first chapter of the thesis
- (B) Researcher must possess analytical ability
- (C) Variability is the source of problem
- (D) All the above

II Research can be conducted by a person who:

- (A) holds a postgraduate degree
- (B) has studied research methodology
- (C) possesses thinking and reasoning ability
- (D) is a hard worker

III Authenticity of a research finding is its:

- (A) Originality (B) Validity (C) Objectivity (D) All

IV The first step of research is:

- (A) Selecting a problem (B) Searching a problem
- (C) Finding a problem (D) Identifying a problem

V Research can be classified as:

- (A) Basic, Applied and Action Research
- (B) Philosophical, Historical, Survey and Experimental Research
- (C) Quantitative and Qualitative Research
- (D) All the above

VI Research problem is selected from the stand point of:

- (A) Researcher's interest (B) Financial support
- (C) Social relevance (D) Availability of relevant literature

VII Research is

- (A) Searching again and again
- (B) Finding a solution to any problem
- (C) Working in a scientific way to search for the truth of any problem
- (D) None of the above

VIII Which of the following is the first step in starting the research process?

- (A) Searching sources of information to locate the problem.
- (B) Survey of related literature
- (C) Identification of the problem
- (D) Searching for solutions to the problem

- IX Manipulation is always a part of
 (A) Historical research (B) Fundamental research
 (C) Descriptive research (D) Experimental research
- X The research which is exploring new facts through the study of the past is called
 (A) Philosophical research (B) Historical research
 (C) Mythological research (D) Content analysis
- XI Action-research is:
 (A) An applied research
 (B) A research carried out to solve immediate problems
 (C) A longitudinal research
 (D) All the above
- XII The process not needed in experimental research is:
 (A) Observation (B) Manipulation and replication
 (C) Controlling (D) Reference collection
- XIII The research that applies the laws at the time of field study to draw more and more clear ideas about the problem is:
 (A) Applied research (B) Action research
 (C) Experimental research (D) None of these
- XIV Research.....is logical and systematic plan for conducting research.
 (A) Problem (B) Design (C) Report (D) Sample
- XV Questionnaire is a.....
 (A) Research Method (B) Measurement technique
 (C) Tool for data collection (D) Data analysis technique
- 2. Long types Answer. Attempt any three. [10×3=30]**
- I Define Research process and explain various steps involved in research process?
- II Describe various types of research and with special emphasis on Applied research?
- III What is need of Questionnaire in conducting research , what are the limitations associated with the same ?
- IV Why, how and what is need of formulating research question and how it helps in generating a good research , help is obtaining funding and good impact research papers.
- 3. Short types Answer. Attempt any five [5×5=25]**
- I What is plagiarism ? How it can be avoided?
- II List down the the steps involved in writing a report?
- III What is research design and what is need of the same?
- IV What you understand by application based research?
- V Define exploratory research?
- VI Write short notes on Intellectual Property rights?
- VII Define IEC and its role in clinical research?