

Answer key

Option A

Q.1 A.

Define the following:

- i) **Special staining**- A stain that highlights features of a cell or organism that cannot be readily identified with routine microbiological staining techniques. (05)
- ii) **Ribosomes**- particle consisting of RNA and associated proteins found in large numbers in the cytoplasm of living cells, responsible for protein synthesis
- iii) **Index case**: the first case in an epidemic
- iv) **Quarantine**: Restriction of the movement of a person with active infection to prevent the spread of the pathogen to other people
- v) **Pasteurization**- It is disinfection by moist heat at temperatures below 100 °C.

Q.1 B.

State whether the following statements are true or false:

- i) MacConkey's agar is an enrichment medium- False (05)
- ii) A sudden occurrence of a disease across many countries is called an outbreak- False
- iii) Small pox has been controlled by immunization. - True
- iv) Dry heat requires longer exposure time and temperature than moist heat- True
- v) Fume hoods contain HEPA filters- False

Q.1 C.

Give one example for each of the following:

- i) **Selective medium**- Macconkeys agar, Sabourauds agar (05)
- ii) **Gram negative organism**- *E. coli*, *Salmonella spp*
- iii) **Vector**- Arthropods Like mosquito, tsetse fly etc.
- iv) **Pandemic**- H1N1 Influenza
- v) **Cold sterilants**- gluteraldehyde, peracetic acid

Q.1 D.

Select the most appropriate alternative:

- i) _____ are organisms that lack a cell wall (*Mycoplasma*, Spirochetes, Actinomycetes) (05)
- ii) _____ produces pyocin pigment (*Escherichia coli*, *Pseudomonas aeruginosa*, *Salmonella paratyphi A*)

- iii) Rotavirus causes _____ (common cold, tetanus, viral gastroenteritis)
- iv) _____ is the time required to bring the load to a particular temperature before sterilization. (Heat penetration time, Boiling at 100°C, sterilization hold time)
- v) Type C fire extinguishers contain _____ to stop fires. (oxygen, carbon monoxide, carbon dioxide)

Q.2 A

Answer any two of the following:

- i) Discuss the structure and functions bacterial cell wall in Gram negative and Gram positive bacteria **Ananthnarayan 8th edn pg no 17-18** (20)
- ii) Write a short note on the bacterial diseases of the nervous system. **Tortora 9th edn. Pg. no.621-622,628-6230**
- iii) Explain the standard precautions set up by the CDC to prevent disease transmission in clinical laboratories and blood banks. (**Bailey 12th edition Pg No.52-54**)

Q.3 A.

Answer any three of the following:

- i) Write a note on viable count methods of bacteria. **Ananthnarayan 8th edn pg no 23** (18)
- ii) Discuss Enriched media and selective media giving one example for each. **Ananthnarayan 8th edn pg no 40**
- iii) Write a note on Principle and applications of Electron Microscope. **Ananthnarayan 8th edn pg no 13,14**
- iv) Discuss the structure and functions of bacterial spores. **Ananthnarayan 8th edn pg no 21, 22**
- v) With the help of a diagram explain the various phases of Growth curve of bacteria. **Ananthnarayan 8th edn pg 23,24**
- vi) What is differential staining? Discuss Acid fast staining in detail. **Ananthnarayan 8th edn pg no 14-15**

Q.3 B.

Do as directed: any two

- i) Define pleomorphism- is the ability of some micro-organisms to alter their shape or size in response to environmental conditions. (02)
- ii) State the use of Yeast extract. Source of vitamins and growth factors
- iii) What are volutin granules? Polyphosphate reserves in the cell

- iv) State the significance of Phase contrast Microscopy. Helps to observe live unstained preparation
- Q.4 A.** **Answer any three of the following:** (18)
- i) Justify "Living reservoirs perpetuate disease" Tortora 9th ed. Pg. no. 411
 - ii) How would you diagnose amoebiosis? Tortora 9th ed. Pg. no.738
 - iii) Describe the preventive measures and treatment for streptococcal pharyngitis. Tortora 9th ed. Pg. no.683
 - iv) Discuss "Pathogen eradication can prevent diseases|Prescott 8th edn. Pg. no. 950
 - v) List and explain the factors which make skin an inhospitable environment for most microorganisms, Tortora 9th ed. Pg. no.590
 - vi) Discuss the pathogenesis of diphtheria Tortora 9th ed. Pg. no.684-685
- Q.4 B.** **Do as directed:** (02)
- i) Explain the term Endemic: Disease maintained at a steady low-level frequency at moderately regular interval
 - ii) Give the full form of ETEC Enterotoxigenic Escherichia coli
 - iii) Why is the Blood Brain Barrier important? Some capillaries selectively allow substances to pass from blood to brain. Only lipid soluble drugs can cross this barrier.
 - iv) Name an organism causing Lock jaw.- **Clostridium tetani**
- Q.5 A.** **Answer any three of the following:** (18)
- i) Discuss the role of washer disinfectant in the process of sterilization. (Mackie & McCartney 14th ed. Pg. 814-815)
 - ii) Write a short note on: Membrane filters. (Mackie & McCartney 14th ed. Pg. 824-825)
 - iii) Justify: 'There are different methods used to disinfect safety cabinets and skin'. (Mackie & McCartney 14th ed. Pg. 828)
 - iv) Discuss the classification of etiological agents on the basis of hazard. (Bailey 12th edition Pg No.57-58)
 - v) Discuss the chemical hygiene plan to be maintained in the laboratory. (Bailey 12th edition Pg No.48)
 - vi) Enlist the different methods to dispose off hazardous hospital waste. (Bailey 12th edition Pg No.52)

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Q.5 B.

Do as directed:

- i) Name the method used to sterilize heat labile culture media. (**Free steaming / Tyndallization**)
- ii) Explain: Discard jars (**Mackie & McCartney 14th ed. Pg 828**)
- iii) What are antiseptics? (**Disinfectants used on living tissues**)
- iv) Give any one example of material sterilized by radiations. (**plastic syringes, gloves, catheters**)

(02)

Option B

- I . Define the following:** (05)
-) Germicide- Any chemical agent that kills microorganisms
 - i) Microbial Death-Permanent loss of reproductive capability, even under optimum growth condition.
 - ii) Psychrotrophs-Microorganisms which grow between 0°C to 35°C
 - v) Restriction enzyme-Prescott: 357
 -) Resolution -Ability of lens to separate or distinguish between small object that are close together

- Q.1 . State whether the following statements are true or false:** (05)
-) True
 - i) True
 - ii) True
 - v) False
 -) True

- Q.I . Give one example of each of the following:** (05)
-) Antisepsis- Swabbing of skin with iodine/H₂O₂, hand washing with germicidal soap
 - i) Protein sequence databases-PIR, SWEES PROT
 - ii) Alcohols used as disinfectant-Ethanol, Propanol
 - v) Chemical Fixative – ethanol, acetic acid, HgCl₂, formaldehyde, glutaraldehyde
 -) Basic dyes- Methylene blue, Basic fuchsin, Malachite green, Crystal violet, Safranin

- Q.I . Select the most appropriate alternative:** (05)
- i) Sterilization
 - ii) Saffranin
 - iii) 15psi
 - iv) *ori*
 - v) Shuttle vector

- Q.2 . Answer any two of the following:** (20)
-) Prescott 147-148
 - i) Talaro 6thedn. Pg 326-328
 - ii) IgnacimuthuPg 1.10 to 1.13

- Q.3 . Answer any three of the following:** (18)
-) Prescott 20-21
 - i) Prescott 166-170
 - ii) Prescott 29
 - v) Prescott 37-38
 -) Prescott 170-171

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- Q.3 . i) Prescott 146-152
Do as directed: (02)
) $d=0.5\lambda/n\sin\theta$
 i) Microorganisms which obtain energy from the oxidation of chemical compounds
 ii) *Pyrococcus abyssi*, *Pyrodictium occultum*
 v) Prescott 168 -169
- Q.4 . Answer any three of the following: (18)
) Talaro 6thedn. Pg 321
 i) Talaro 6thedn. Pg 326
 ii) Talaro 6thedn. Pg 325-326
 v) Talaro 6thedn. Pg 336-337
) Talaro 6thedn. Pg 333
 i) Talaro 6thedn. Pg 330-331
- Q.4 . Do as directed: (02)
) 63-66°C for 30min Or 71.6°C/72°C for 15seconds.
 i) HEPA filter
 ii) Phenol coefficient quantitatively compares a chemical's antimicrobial property with that of phenol.
 v) 3%
- Q.5 . Answer any three of the following: (18)
) Prescott pg 366 and fig 14.06
 i) Prescott : 378-380
 ii) Prescott: 371
 v) Prescott: 362
) IgnacimuthuPg 5.6 to 5.9
 i) Prescott: 370
- Q.5 . Do as directed: (any 2) (02)
) Ignacimuthupg: 6.2
 i) cDNA
 ii) Prescott: 362
 v) Ignasimutthu. Pg. no. 6.16