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Sr. No. of Question Paper : 1524 **G**

Unique Paper Code : 3182012301

Name of the Paper : Medical Microbiology – UGCF Core Paper

Name of the Course : **B.Sc. (Hons) Biomedical Science**

Semester : III

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Answer **five** questions in all.
3. Question No. **1** is compulsory.
4. Give illustrations and examples wherever necessary.
5. Subparts of the questions should be attempted together.

P T O

1. (a) Mention the contributions of the following Scientists **(Any four)** (4×1=4)

(i) Elie Metchnikoff

(ii) Alexander Fleming

(iii) Charles Chamberland

(iv) Edward Jenner

(v) Robert Hooke

(b) Mention the causative organisms of the following diseases **(Any three)** (3×1=3)

(i) Pertussis

(ii) Leprosy

(iii) Gonorrhea

(iv) Tetanus

(c) Give one word for the following **(Any five)** : (5×1=5)

(i) The bacteria which are able to grow at 0°C but which optimally grow at 10°C to 30°C.

(ii) Endotoxin released by a gram negative organism.

(iii) Technique employed to create a oxygen-free environment for bacteria that cannot survive or thrive when oxygen is present.

(iv) A culture medium in which the exact chemical composition is known.

(v) The transfer of genetic material from one cell to another involving cell-to-cell contact.

(vi) Lowest concentration of a toxic substance in an environmental medium that kills individual organisms or test species under a defined set of conditions

(vii) Study of genomes recovered from environmental samples without isolating members of microbial community and growing them in pure cultures.

(d) Justify the statement : **(Any three)** (3×2=6)

(i) MacConkey agar is both selective and differential media which is used for the growth of microorganisms.

(ii) Concentration of 75% ethanol is more effective than 100% ethanol as a bactericidal agent.

(iii) It important that the air initially present in the autoclave chamber is forced out.

(iv) Carriers are important reservoirs in transmission of infection.

2. (a) Differentiate between the following **(Any four)** :

(4×3=12)

(i) Hemagglutination and Plaque assay

(ii) Viroids and Prions

(iii) Lethal Dose and Infectious Dose

(iv) Lysis and lysogeny

(v) Typhoid and Cholera

(b) Answer **any one** of the following : (6)

(i) Discuss the factors contributing to the characteristic sigmoidal growth curve observed when bacteria grow in a batch culture.

(ii) Discuss different types of flagellar movement in bacteria.

3. (a) What is the generation time of a bacterial population that increases from 10,000 cells to 10,000,000 cells in four hours of growth? (6)

(b) Discuss what are nosocomial infections. Give appropriate examples. (6)

(c) Discuss how endospores are formed? (6)

4. (a) Discuss the differences between gram-negative and gram-positive cell wall? (6)

(b) Describes the process of specialized transduction in bacteria. (6)

(c) Discuss the life cycle of Candida albicans. (6)

5. (a) Discuss the pathogenic effects of Staphylococcal infections that are caused by contaminate food. (7)

(b) Expand the following acronyms **(any five)** :

(5×1=5)

(i) SEM

(ii) NAG

(iii) MPN

(iv) Hfr

(v) FISH

(vi) CFU

(vii) VBNC

(c) Provide a concise explanation of the one-step growth curve in virus multiplication within a host cell, and include suitable diagrams to illustrate the process. (6)

6. (a) Discuss the structure of Influenza virus. Discuss the measures to control its spread. (3)

(b) Describe Robert Koch's postulates describing the relationship between microorganisms and the disease caused. (3)

(c) Write short notes on **(any four)** : (4×3=12)

(i) Capsids

(ii) Lipopolysaccharides

(iii) Chemotaxis

(iv) Inclusion Bodies

(v) Classification of viruses on the basis of nucleic acids

(vi) Organisms not seen on Gram Stain