



MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)
Rasipuram - 637 408, Namakkal Dist., Tamil Nadu.

Department of Biomedical Engineering Question Bank - Academic Year (2020-21)

Course Code & Course Name : 19HSS08&Professional Ethics and Human Values
Year/Sem/Sec : II/III

UNIT I : Human Values

Part-A (2 Marks)

1. What are human values?
2. What are ethical values?
3. Distinguish values from ethics and culture.
4. What is integrity?
5. Define work ethics
6. What is service learning?
7. Mention some civic virtues?
8. Write short notes on caring and sharing..
9. Write notes on honesty.
10. Define spirituality.

Part-B (16 Marks)

1. What are Human values? Explain briefly
2. Define Empathy State and explain the elements benefits of Empathy and compare Empathy with Sympathy?
3. Explain character and spirituality and their importance in ethics? .
4. Discuss the scope and aims of Engineering ethics. Scope and aim of engineering ethics Professions and professionalism?
5. Where and how do moral problems arise in engineering? What is professional responsibility? Discuss theories about virtues

UNIT II : Engineering Ethics

Part-A (2 Marks)

1. State the three types of Inquiry?
2. What are the two important versions of utilitarianism?
3. what is meant by engineering as experimentation ?.

4. state the important of ethical theories ?
5. State Gilligan's theory ?
6. what is meant by consensus ?
7. What does Moral Autonomy mean?
8. List the complexities that are involved in moral situations?
9. Define professionalism
10. State the use of ethical theories??

Part-B (16 Marks)

1. Describe the professional roles played by an engineer?
2. Describe Kohlberg and Gilligan's theories on moral autonomy?
3. Explain the details about the senses of engineering Ethics ?
4. Explain the types of inquiries in engineering?
5. Discuss in detail the various ethical theories and their uses ?

UNIT III : Engineering as Social Experimentation

Part-A (2 Marks)

1. What is meant by conscientiousness?
2. What are codes of Ethics referred to?
3. what are the uncertainties occur in model design ?
4. Why engineers are industrial standards?
5. Define Engineering Ethics ?
6. What do you understand by "a balanced outlook on law"?
7. What is meant by valid consent?
8. What are the Senses of Engineering Ethics?
9. What is the purpose of various types of standards?
10. Define Code?

Part-B (16 Marks)

1. What are codes of Ethics ? State and explain the function of codes of ethics and the objective to codes ?
2. Discuss the problems associated with laws in engineering and Enumerate the proper role of law engineering ?
3. What is the importance of codes of ethics ?explain in detail ?
4. Explain "Engineers as Responsible Experimenters".?
5. What are the similarities between engineering experiments and standard experiments?

UNIT IV : Engineers' Responsibility for Safety and Risk

Part-A (2 Marks)

1. Define Safety?
2. What is the use of risk analysis?
3. Define the term collective bargaining?
4. Define the term Risk?
5. Define „Risk benefit analysis?
6. Give any two examples of improved safety?
7. What is meant by risk? State the causes of risks?
8. What are the drawbacks in the definition of Lawrence?
9. Give the categories of Risk?
10. What are the factors that affect Risk Acceptability?

Part-B (16 Marks)

1. What is meant by conflict of interest? Distinguish between general and professional conflicts of interest and discuss the various types of conflicts of interest?
2. What are intellectual property rights? Explain the elements of intellectual property rights in details and benefits of IPRS?
3. Discuss the causes of Bhopal disasters. Explain the responsibility of engineers in the design of product in the design stage itself before the event of an accident?
4. Explain how the risks are reduced & explain the concept of „Risk-Benefit Analysis“?
5. What are the factors that affect risk acceptability?what is the use of knowledge of risk acceptance to engineer ?

UNIT V : Engineers' Responsibilities and Rights

Part-A (2 Marks)

1. Point out the responsibilities of consulting engineers?
2. What do you mean by IPR ?
3. What is meant by moral leadership?
4. What is the Importance of IPR?
5. Define Employee Rights?
6. What is Fick's technique?
7. Differentiate Open Whistle Blowing and Anonymous Whistle Blowing?
8. Differentiate External Whistle Blowing and Internal Whistle Blowing?
9. When are Whistle Blowing morally permitted and morally obligated?
10. What are the three versions of Relativism?

Part-B (16 Marks)

1. Explain in detail about Colleguality and the techniques of achieving collegiality.
2. Explain about loyalty and the two senses of loyalty.
3. Explain about the conflicts of interest.
4. Explain about collective bargaining and confidentiality
5. Explain in detail about whistle blowing and the types of whistle blowing.

Course Faculty

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Department of Medical Electronics Question Bank - Academic Year (2020-21)

Course Code & Course Name : 19MDD03&Biomedical Instrumentation and Measurements

Year/Sem/Sec : III/V

Unit-I: ELECTROPHYSIOLOGY AND BIOPOTENTIAL ELECTRODES

Part-A (2 Marks)

11. Define Resting Potential and Action potential
12. Define depolarization and repolarisation.
13. What is electrode? List out the types and explain
14. What are the classification of non polarizable electrode?
15. List out some example of internal and external electrode and their uses.
16. Define half cell potential.
17. State the uses of electrode paste.
18. List the different types of Micro electrodes.
19. List the different types of internal electrodes.
20. What is meant by sodium pump?

Part-B (16 Marks)

5. Explain generation of Action potential and its propagation
6. Explain Electrode –Skin Interface with its equivalent circuit diagram
7. Explain in detail about various types of electrodes used for the measurement of biopotential signals.
8. What are body surface electrodes? Discuss in detail with various examples.
5. Describe the generation and features of action potential and also explain the refractory period of a cell

Unit-II : BIO-POTENTIAL MEASUREMENTS OF PARAMETERS

Part-A (2 Marks)

11. Define ECG
12. What are the different artefacts encountered while recording ECG?
13. What are the important bands of frequencies in EEG and state their importance.
14. Define EEG
15. What are the different artefacts encountered while recording EEG?
16. What is montage system?
17. What is evoked potential?
18. Define – Conduction Velocity
19. Draw the typical ECG waveform.
20. What are the different types of ECG lead configuration?

Part-B (16 Marks)

6. What is evoked potential? Explain EEG recording with suitable block diagram
7. Draw the ECG waveform indicating typical time intervals and amplitude of the waves? Explain how these waves are physiologically correlated with heart's activity
8. Explain EEG measurement with 10-20 Electrode system
9. Discuss the different components of EEG measurement. Discuss the desired features of electromyography.
10. Describe in detail about the principle used for electrodes in the measurement of ECG, EEG, EMG?

Unit-III : BIO AMPLIFIER WITH SIGNAL CONDITIONING CIRCUITS

Part-A (2 Marks)

11. Write the effect of power line interference in bio signal recording?
12. What is the need for band pass filters in biological pre-amplifiers?
13. Write any two conditions of biological preamplifiers.
14. What is powerline interference?
15. Differentiate single ended and differential ended mode of a biological amplifier.
16. Why do we require isolation amplifiers in a biomedical instrument?
17. Mention the different types of filters used in biosignal measurement.
18. What are the characteristics of a DC amplifier?
19. What are the types of chopper amplifier?
20. Mention the characteristics of instrumentation amplifier

Part-B (16 Marks)

6. Explain in neat sketch about the right leg driven ECG amplifier?
7. What is an isolation amplifier? What is its significance? Illustrate any one type.

8. Distinguish biological amplifier from a conventional amplifier with suitable equations and circuits
9. Sketch a neat circuit diagram of a medical preamplifier and deduce an expression for its net gain.
10. Draw the buffer amplifier circuit and explain its working.

Unit-IV : MEASUREMENT OF NON-ELECTRICAL PARAMETERS

Part-A (2 Marks)

11. Explain the principle of electromagnetic blood flow measurement.
12. What is thermal dilution in cardiac output measurement?
13. What is cardiac output and stroke volume?
14. What is korotkoff sound?
15. What are the methods used to measure blood pressure is directly?
16. What is meant by Doppler Effect?
17. Give the methods for measuring blood flow.
18. What are the methods involved in direct blood pressure measurement?
19. Give the principle of transduction of heart sounds.
20. Give the principle of transduction of heart sounds.

Part-B (16 Marks)

6. Explain the rheographic method of blood pressure measurement? Describe in detail about the auscultatory method of blood pressure measurement
7. Describe the working principle of ultrasonic blood pressure measurement. Compare direct and indirect blood pressure measurement
8. What is cardiac output? Explain its measurements with suitable diagram.
9. Write short notes on Indicator dilution technique for cardiac output measurement
10. What are the methods for measuring blood pressure? Sketch a typical setup and explain

Unit-V : BIO-CHEMICAL MEASUREMENT

Part-A (2 Marks)

11. What are the principal components of auto analyser?
12. What is the principle of colorimeter?
13. What is an autoanalyser and what are its advantages and disadvantages?
14. What are the differences between spectrophotometer and colorimeter?
15. Mention the clinical significance of PO₂ and PCO₂ in blood.
16. What is Fick's technique?
17. What is the principle of blood glucose sensor?
18. What are the methods of blood cells counting?
19. What are photometers?

20. Define IMFET.

Part-B (16 Marks)

6. Explain in detail about blood gas analyzer with neat block diagram.
7. Explain the working principle of spectrophotometer. Discuss its applications in clinical laboratory
8. Explain with block diagram about the working of colorimeter
9. Explain in detail about P_{CO2}, P_{O2} and Ph sensor.
10. Explain in detail about ISFET and IMFET.

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