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Question Paper Code	13388
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025**

Eighth Semester

**Electronics and Communication Engineering**

**20ECEL808 - MEDICAL INFORMATICS**

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

**PART - A (MCQ) (10 × 1 = 10 Marks)**

Answer ALL Questions

		<i>Marks</i>	<i>K – Level</i>	<i>CO</i>
1.	What is the primary goal of bioinformatics? (a) Data compression (b) Storage and analysis of biological data (c) DNA synthesis (d) Protein degradation	1	K1	CO1
2.	The basic network protocol that determine the rules used to create and routes packets of data between computers is (a) HL7 (b) TCP/IP (c) URL (d) XML	1	K1	CO1
3.	Which of the following is an example of an online service provided by a Hospital Management System (HMS)? (a) Patient registration (b) Online appointment scheduling (c) Prescription dispensing (d) In-person laboratory tests	1	K1	CO2
4.	Which service is an example of an offline service in a hospital's pharmacy management system? (a) Online medication refill requests (b) In-person medication dispensing and consultation (c) Prescribing medications via telemedicine (d) Remote tracking of medication stocks	1	K1	CO2
5.	The PICO framework in EBM stands for: (a) Patient, Institution, Care, Outcome (b) Patient, Intervention, Comparison, Outcome (c) Practice, Investigation, Compliance, Outcome (d) Patient, Insurance, Care, Operation	1	K1	CO3
6.	Which international document first established the principle of voluntary consent in medical research? (a) Belmont Report (b) Nuremberg Code (c) Helsinki Declaration (d) Universal Declaration of Human Rights	1	K1	CO3
7.	Which type of DAQ board is commonly used for real-time monitoring of bio-signals in hospitals? (a) Gaming graphics card (b) National Instruments USB DAQ (c) Hard disk drive (d) Wi-Fi router	1	K1	CO4
8.	How does Total Laboratory Automation (TLA) impact modern clinical laboratories? (a) It fully automates all laboratory processes, improving efficiency and accuracy. (b) It introduces a manual method for conducting lab tests. (c) It is a software system designed to replace laboratory machines. (d) It is primarily used for medical imaging rather than lab testing.	1	K2	CO4
9.	How does VR help in remote surgical training? (a) It allows surgeons to practice surgeries remotely using VR simulations (b) It prevents global access to medical training (c) It reduces learning opportunities for students (d) It increases surgical errors	1	K1	CO5
10.	Composite databases are formed by integrating data from multiple sources. Which of the following is a composite database? (a) STRING (b) PDB (c) KEGG (d) GenBank	1	K1	CO6

**PART - B (12 × 2 = 24 Marks)**

Answer ALL Questions

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|---|---|----|-----|
| 11. What is gene expression analysis?   | 2 | K1 | CO1 |
| 12. Give the significance of BLAST in bioinformatics.                                       | 2 | K1 | CO1 |
| 13. In what ways do EHR systems contribute to effective hospital management?                | 2 | K1 | CO2 |
| 14. How do hospitals use inventory management to support daily operations?                  | 2 | K2 | CO2 |
| 15. In what ways are JCAHO and JCIA accreditation standards different?                      | 2 | K2 | CO3 |
| 16. Define bioethics.   | 2 | K1 | CO3 |
| 17. Mention two key requirements of a medical data acquisition system.                      | 2 | K1 | CO4 |
| 18. Explain the role of data mining in disease prediction.                                  | 2 | K2 | CO4 |
| 19. How can Virtual Reality (VR) be applied to support physical rehabilitation in patients? | 2 | K3 | CO5 |
| 20. Why is teleradiology important for patient care in rural or remote areas?               | 2 | K1 | CO5 |
| 21. What is a genome project?   | 2 | K1 | CO6 |
| 22. State the differences between relational databases and Semantic Web databases.          | 2 | K1 | CO6 |

**PART - C (6 × 11 = 66 Marks)**

Answer ALL Questions

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| 23. a) In detail explain the applications of computerized prescriptions for patients.  | 11 | K2 | CO1 |
| <b>OR</b>  |    |    |     |
| b) Discuss in detail the hardware and software requirements of various levels of medical informatics with suitable illustration. | 11 | K2 | CO1 |
| 24. a) Explain the primary differences between online and offline services in a hospital management system.                      | 11 | K2 | CO2 |
| <b>OR</b>  |    |    |     |
| b) Explain the components of an expert system with a diagram.  | 11 | K2 | CO2 |
| 25. a) Describe the importance of Evidence-Based Medicine (EBM) in clinical practice.  | 11 | K2 | CO3 |
| <b>OR</b>  |    |    |     |
| b) Explain the role of Joint Commission International (JCI) in improving healthcare standards.                                   | 11 | K2 | CO3 |
| 26. a) Discuss the various data mining techniques used in medical informatics and their benefits.                                | 11 | K3 | CO4 |
| <b>OR</b>  |    |    |     |
| b) Explain the concept of medical databases, their types, and their importance in healthcare.                                    | 11 | K2 | CO4 |
| 27. a) Discuss the role of Virtual Reality (VR) in pain management and mental health treatment.                                  | 11 | K3 | CO5 |
| <b>OR</b>  |    |    |     |
| b) Explain the role of AI and machine learning in modern medical expert systems.   | 11 | K2 | CO5 |
| 28. a) Discuss pathway and interaction databases and their role in systems biology.  | 11 | K3 | CO6 |
| <b>OR</b>  |    |    |     |
| b) Explain the role and significance of Clinical Informatics in modern healthcare.   | 11 | K2 | CO6 |