**LMS Questions for DLMIHMEIPMT**

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| **Unit/**  **Question Number** | **Section** | **Question** | **Correct answer** | **Incorrect answer** | **Incorrect answer** | **Incorrect answer** |
| 1/1 | 1.1 | What is the third content dimension – besides products and processes – where innovation happens? | services | market | technology | organization |
| 1/2 | 1.2 | Which area of innovation measurement is informed by the chemical structure of a new drug? | novelty | knowledge | value creation | implementation and adoption |
| 1/3 | 1.3 | Which of the following stakeholder groups is important for both the invention and the commercialization phase of a pharmaceutical innovation? | patient advocacy organizations | wholesalers | innovation centers | cluster organizations |
| 1/4 | 1.4 | The sourcing of external knowledge belongs to which firm-level determinant area of innovation? | managerial levels | leadership | business processes | not a firm level determinant |
| 1/5 | 1.5 | Which of the following attributes of a pharmaceutical innovation is not evaluated by regulatory agencies? | price | efficacy | safety | quality |
| **Unit/**  **Question Number** | **Section** | **Question** | **Correct answer** | **Incorrect answer** | **Incorrect answer** | **Incorrect answer** |
| 2/1 | 2.1 | What is the consequence of two parties not sharing the same level of information? | information asymmetry | moral hazards | fraud | signaling |
| 2/2 | 2.2 | Market barriers can occur due to … | … the regulation and legislation of local authorities. | … high development costs. | … the power of competitors. | … product acceptance by customer. |
| 2/3 | 2.3 | What is a patent? | intellectual property | a right to use an invention | an innovation | a protective law |
| 2/4 | 2.4 | Which coding system is relevant for DRG reimbursement? | ICD – International Classification of Diseases | MDR – Major Diagnostic Reference | IPD – International Procedure of Diseases | IPMC – International Procedures of Medical Categories |
| 2/5 | 2.5 | Why are small patient numbers per rare disease indication a hurdle for pharma companies investing in R&D activities? | Small patient numbers limit sales expectations and changes clinical trial conduct. | Small patient numbers increase the risk of failure in clinical trials. | Small patient numbers don’t allow for appropriate research activities before starting development. | Small patient numbers are prohibitive to the achievement of appropriate price levels. |
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| 3/1 | 3.1 | Which of the following sub-domains does not fall under the non-clinical domains of the EuNetHTA Core model? | health problem and current use of technology (CUR) | patient and social aspects (SOC) | ethical analysis (ETH) | Cost and economic evaluation (ECO) |
| 3/2 | 3.2 | According to the course book, which of the following is the key driver of a company decision to develop an innovation up to launch? | expected financial return | the medical need in a specific disease | the costs of development | the probability of technical success |
| 3/3 | 3.3 | Which of the following innovation categories has contributed the most to improvements in morbidity and mortality in the US between 1990 and 2014? | innovation in pharmaceuticals | innovation in diagnostics | innovation in medical devices | innovation in surgery |
| 3/4 | 3.4 | In which of the following situations do the ethical principles of beneficence and autonomy collide? | The patient rejects an offer to receive a potentially life-saving intervention. | The patient gets the best possible treatment without their informed consent. | The patient is not informed about the full truth of an intervention as rapid treatment is needed. | The patient’s confidential health data are disclosed without authorization to find the best treatment option. |
| 3/5 | 3.3 | What is the leading cause of death globally? | ischaemic heart disease | cancer | stroke | diabetes mellitus |
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| 4/1 | 4.1 | What are the basic technologies and concepts for AI-assisted surgery? | decision support, context aware assistance, and cognitive robotics | surgery discovery, clinical trial, and management | deep learning, computer vision, and natural language processing | machine learning, autonomous surgical procedures, and human machine teaming |
| 4/2 | 4.2 | Which of the following statements is false? | Virtual reality (VR) and augmented reality (AR) are interchangeable. | Virtual reality (VR) and augmented reality (AR) are used as tools, guidance, and therapeutics. | Virtual reality (VR) and augmented reality (AR) need means to track motion. | Virtual reality (VR) can cause sickness. |
| 4/3 | 4.3 | What do blocks of a blockchain contain? | The blocks contain information in the form of header and transaction. | They rely on bitcoins. | The blocks contain encryption codes. | The blocks contain algorithms. |
| 4/4 | 4.4 | What is a major advantage of 3D printing? | design freedom | high quantities | easy manufacturing process validation | long-term experience |
| 4/5 | Introduction | Disruptive innovations ... | … trigger fundamental or radical changes of existing practices. | … cause incremental and persistent changes to existing practices. | … undermine existing practices with novel technologies. | … delay the development of novel technologies. |
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| 5/1 | 5.1 | Precision medicine designs a treatment based on the patient’s… | … genetic or proteomic profile. | … needs and preferences. | … education and intellectual capacity. | … gender and age. |
| 5/2 | 5.1 | In which population is prophylactic bilateral mastectomy (surgery to remove a breast) recommended to reduce the risk of breast cancer? | women with mutations in the BRCA1 or BRCA2 gene | women with a genetic variation in the drug metabolizing enzyme CYP450 | women with the e4 genetic variant of the APOE gene | women with a V600E mutation in the B‑Raf gene |
| 5/3 | 5.2 | What is the correct term for a molecule or compound associated with a biological condition or disease? | biomarker | phenotype | genetic sequence | microbiome |
| 5/4 | 5.3 | In the context of artificial intelligence, what is a training set? | a dataset that teaches the model to optimize the parameters for achieving the desired task | a dataset on which the performance of a previously trained model is tested | a dataset that is used to validate the performance and to establish the parameters of the model during training | a process to develop, manage, and enhance clinical trial procedures |
| 5/5 | 5.4 | Which of the following is a rare disease represented by the members of EUPATHI? | hemophilia | diabetes | arthritis | iron deficiency |
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| 6/1 | 6.1 | What are nanoparticles and how are they being explored in nanomedicine? | Nanoparticles are structures that are 80,000 times smaller than a human hair. They are being explored for their unique properties that can't be achieved with larger particles or dissolved chemicals. | Nanoparticles are structures that are 6,000 times larger than a human hair and are mainly used as coating. | Nanoparticles are structures that are solely made of organic materials to be biocompatible. | Nanoparticles are structures that are used for faster metabolization of drugs. |
| 6/2 | 6.1 | How do liposome-based nanomedicines work and what have they been approved for? | Liposome-based nanomedicines work by encapsulating drugs inside tiny liposomes, which are then able to target specific cells in the body for treatment. They have been approved for use in cancer treatment. | Liposome-based nanomedicines work by releasing drugs into the bloodstream to treat any disease. | Liposome-based nanomedicines work by delivering drugs directly to the liver to treat liver disease. They have not been approved for use in cancer treatment. | Liposome-based nanomedicines have not been approved for use in any medical treatments. |
| 6/3 | 6.2 | What is the potential of lab-on-a-chip technology in healthcare? | Lab-on-a-chip technology has the potential to allow for the decentralization of medical testing by analyzing tiny sample quantities with a microfluidic chip, pump, sensor, and software. This technology can be used for constant monitoring of diseases like diabetes or COVID-19. | Lab-on-a-chip technology has a high potential in healthcare due to its high quantity and inaccuracy. | Lab-on-a-chip technology is only able to perform very basic medical tests and cannot be used for complex diagnostics. | Lab-on-a-chip technology is only useful for detecting rare diseases that affect very few people. |
| 6/4 | 6.3 | What is digital health and what are some of its applications in medicine? | Digital health involves the use of technology and data to improve health outcomes. Its applications in medicine include digital therapeutics, in silico medicine, digital twins, and big data analysis. | Digital health combines the use of ancient medical practices that are digitalized in modern medicine. | Digital health is only used in research and will take over most physicians’ work in the future. | Digital health is a type of alternative medicine that has not been scientifically proven to be effective. |
| 6/5 | 6.4 | How is image guided intervention (IGI) being used to improve surgical accuracy and safety? | Image guided intervention (IGI) uses medical imaging technologies, such as X-rays, MRI, and ultrasound, to guide minimally invasive surgical procedures in real-time, improving surgical accuracy and safety. | Image guided intervention (IGI) is a type of surgery that does not use any medical imaging technologies. | Image guided intervention (IGI) is only used for cosmetic surgeries and has no practical medical applications. | Image guided intervention (IGI) is a type of surgery that is less accurate and more dangerous than traditional surgical techniques. |
| **Unit/**  **Question Number** | **Section** | **Question** | **Correct answer** | **Incorrect answer** | **Incorrect answer** | **Incorrect answer** |
| 7/1 |  |  |  |  |  |  |
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| **Unit/**  **Question Number** | **Section** | **Question** | **Correct answer** | **Incorrect answer** | **Incorrect answer** | **Incorrect answer** |
| 8/1 |  |  |  |  |  |  |
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| **Unit/**  **Question Number** | **Section** | **Question** | **Correct answer** | **Incorrect answer** | **Incorrect answer** | **Incorrect answer** |
| 9/1 |  |  |  |  |  |  |
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| **Unit/**  **Question Number** | **Section** | **Question** | **Correct answer** | **Incorrect answer** | **Incorrect answer** | **Incorrect answer** |
| 10/1 |  |  |  |  |  |  |
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