UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Course: IOT for Healthcare (CSEG 493)   Semester: VII
Programme: B.Tech_CSE Splz HI

Time: 03 hrs.   Max. Marks: 100
Instructions: Attempt all the questions. Internal choice is given in Question Nos 9, 10 and 12.

SECTION A

S. No.		Marks	CO
Q 1	Define term 'Internet of Things'. What are the key factors responsible for the growth of IoT based solutions?	4	CO1
Q 2	Give your analytical view on possibility of *remote health diagnostics* in India.	4	CO2
Q 3	List the key benefits of operating room integration systems.	4	CO3
Q 4	Design a basic body temperature measurement system that displays data on serial monitor.	4	CO4
Q 5	Explain the issues for co-existence of humans and robots.	4	CO5

SECTION B

Q 6	Explain the evolution and history of IOT systems. What are the enabling elements of IOT?	8	CO1
Q 7	How is self-monitoring of health possible with mobile applications? Explain ecological momentary assessment (EMA).	8	CO2
Q 8	Analyze the impact of evolution of Body Area Network (BAN) technology on the development of patient heath monitoring systems. Why device interoperability is required for IOT based healthcare systems?	8	CO3
Q 9	What is edge analytics and what are its benefits? Elaborate the different protocols used in design of IOT systems. **OR** How can IOT based solution help in early detection of Dementia and Alzheimer's disorders? List and explain at least 5 emerging applications of IOT in healthcare sector.	8	CO4
Q 10	Project the future opportunities in the field of IOT in healthcare. What are the key challenges for growth in this sector? **OR** How is data analytics helpful in healthcare? What are the modern research and development trends in healthcare informatics?	8	CO5

SECTION-C

Q 11	What is the future of cognitive digital technologies? Explain the concept, working, applications and limitations of Digital Twin. How IOT can influence society and	20	CO5

	people?		
Q 12	What do you understand by surgical therapeutics? How IBM Watson can be used to design intelligent healthcare solutions? What are the choices of data storage available for massive healthcare systems? **OR** What are the privacy and security threats associated with IOT based healthcare systems? Devise a framework that may overcome these threats. Explain the applications of IOT communication.	**20**	**CO3, CO4**

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SECTION A

S. No.		Marks	CO
Q 1	What do you understand by 'sensor'? What are the different types of sensors used for developing intelligent healthcare systems?	4	CO1
Q 2	Will the emergence of smart healthcare systems eliminate the need of a doctor? Justify your answer.	4	CO2
Q 3	How is *robot assisted surgery* helpful? What are some other application areas of robots in healthcare?	4	CO3
Q 4	What are key components of an IOT system? Sketch the design of a blood pressure monitoring system.	4	CO4
Q 5	"Robots will manufacture and repair robots"- explain?	4	CO5

SECTION B

Q 6	What are the enabling technologies for IOT? List the key milestones achieved in this field in last few decades.	8	CO1
Q 7	What are the different sensors available in modern smart phones, which are useful in developing health monitoring systems? List few smart phone applications, which are based on these sensors.	8	CO2
Q 8	What do you mean by Body Area Network (BAN)? How is this technology useful in development of patient heath monitoring systems. How interoperability is still an issue?	8	CO3
Q 9	How technology can help in early detection of mental disorders? Explain any two smart healthcare systems. **OR** What are the different protocols used in design of IOT systems? What is edge analytics and what are its benefits?	8	CO4
Q 10	What are the career options in healthcare informatics domain? What are the modern research and development opportunities in the field? **OR** What are the key factors responsible for growth in IOT? Explain its applications in at least three domains.	8	CO5

SECTION-C

Q 11	The life expectancy of people in India is improving. How technology will play a role in managing and monitoring the elderly healthcare? Explain the concept, working,	20	CO5

	applications and limitations of Digital Twin. What is the societal impact of smart heath systems?		
Q 12	How can cloud based technologies be useful in healthcare domain? What are the key challenges & shortcomings of such systems and how can we overcome them? Explain the applications of IOT communication. **OR** What are wearables? Give some examples of wearables for healthcare. How IBM Watson can be used to design intelligent healthcare solutions? What are the choices of data storage available for massive healthcare systems?	**20**	**CO3, CO4**