

ECII/ECSI/ECCI 4204: EMERGING TECHNOLOGICAL TRENDS IN ICT AND SOCIETY

Time: 2 Hours

Instructions to candidates:

This paper consists of FIVE Questions. Answer Question ONE and any other TWO Questions

Write your college number on the answer sheet.

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QUESTION 1 (30 Marks) COMPULSORY

1. Define the following terminologies and give one relevant example for each [3 marks]
 - i) Emerging Technology
 - ii) Trend
 - iii) Disruption
2. Some tech pundits believe that the current trend of foldable smartphones marks the beginning of the end of smartphones as we know it. They further predict a future where the era of the smartphone is over. By contrast, Google's newest idea in 2020 is to stop us from spending more time on our phone. To achieve this goal Google has designed a special sealed envelope which you can place your phone in. Once your phone is inside the smart envelope only the phone camera and basic keypad to dial numbers can be used. Use the two contrasting definitions of emerging trends according to technology management authors Rotolo and Halaweh to determine which of the two trends between foldable smartphone and Google smart envelope will bring about a true paradigm shift for smartphones? [5 marks]
- c) Discuss the link between I.T. asset management software and patch management software in the context of their application for simplifying management of multi-user computing environments such as a computer lab [4 marks]
- d) Describe the future projected impact on i) society and ii) business within the next five-ten years for the following technology:-
 - (i) IBM Food Trust's block chain for advanced food tracking and packaging [3 Marks]
 - (e) Differentiate between the current telephone centric data communication networks and the future all I.P. (internet protocol) based next generation data networks [2 marks]
 - f) The following is a graph illustrating Moore's Law applied to Intel Processors. Use it to interpret the relationship between Nielsen's law of internet bandwidth and computing power [4 marks]
 - g) According to popular American media technology website cnet.com, the following trends from the past decade 2010-2019 were either a failure or successes. For each technology provide an argument why it may not necessarily have succeeded or failed inspite of cnet's assertions [6 marks]
 1. Non-traditional keyboard centric computers
 2. Libra cryptocurrency

h) The use of in-store robots as customer service assistants in popular retail shops such as Carrefour Kenya is related to the current on-going 4th industrial revolution business and commerce innovations worldwide. Justify why their usage will significantly impact society in a different way compared to previously before they were not in use [3 marks]

QUESTION TWO (20 Marks)

a) You have recently graduated after successfully completing your computer science qualification. Technical university of Kenya hires you to convert room D31 in Block D school of computing into a computer lab. They also want you to manage this new lab before handing it over back to them. Develop a detailed computer management plan showing what tasks, actors and roles you predict would be needed to install and run hardware of 10 networked machines, each with software installed in this new lab. Use both best practices and emerging trends in your plan to justify what type of computer lab designs and layouts you would suggest for them to implement and why [6 Marks]

b) The latest 2020 innovation unveiled by Uber Kenya is their rider confirmation short code number. This is a secret 4 digit number sent by Uber directly to a passenger's smartphone once the uber vehicle arrives at the passenger's pick up point. Only after the passenger enters the uber and reveals this short code number to the driver can the journey to their final destination commence. Use one relevant example to justify whether you support or don't support this emerging trend [3 marks]

c) Define the term 3D printing [2 marks]

d) In his essay 'why the future does not need us', the computer futurist William "Bill" Joy details the new Luddite challenge. Differentiate between a luddite and non-luddite by relating any three arguments of his to match the definitions of those two terms [5 marks]

e) Explain the difference between a processor's model and a processor's generation e.g. for Intel or AMD processors? [1 mark]

f) Whereas transitioning from 2G to 3G was as simple as switching SIM cards on your phone, this was not the case when the current 4th generation network was rolled out and most certainly will not be the case for its future successor the 5G standards. Provide a breakdown of one capability that needed to be laid out as groundwork before 4G was implemented, and two additional capabilities that need to yet be laid out as groundwork before 5G can be implemented [3 marks]

QUESTION THREE (20 Marks)

a) In the current 4th industrial revolution taking place right now across the developed world, technologies are merging with humans' physical lives. Describe how this revolution is gradually taking shape in the area of home automation by giving an example of how home automation works using three common smart home standards.

Explain how one of the standards can be used to control your smart home both from within and outside [5 marks]

b) Whereas an individual computer can be locked down to prevent public use by pressing Ctrl + Alt + Del and selecting lock this computer, there are automated ways to perform device lock down in a multi-user computing environment. Explain how you would implement the principle of least privilege during device lockdown [3 marks]

c) Compare and contrast two differences between traditional software development life cycle (SDLC) process and Low Code Development emerging trends of writing software [2 marks]

d) Google maps on iPhone and Android now shows drivers the location of police speed traps. Drivers share police trap positions and other updates to maps. This information is available to everyone navigating with Google. The feature comes from the Waze app which Google acquired in 2013. Make a reasoned argument in support or against whether this emerging trend will improve transport in Kenyan society. [3 marks]

e) 5G has been years in the making because the superior connectivity it promises to offer will transform everything. Defend the reasons why it has shorter wavelength despite using higher frequency waves [3 marks]

f) Digital scent technology is an emerging trend which is just beginning. It allows transmission of smells over the internet. Draw a basic system design diagram illustrating the actors, as well as front and backend showing how such an application would work [4 marks]

QUESTION FOUR (20 Marks)

a) In response to William "Bill" Joy's widely published essay "why the future does not need us" Dr. John Messerley critically responded to Joy's 9 arguments about the consequences of rapidly expanding technology. Analyse Messerley's specific point critiquing Joy's "the notion of unintended consequences brought about by the emergence of 21st century technologies" argument. In your analysis highlight one relevant example in Kenya today which supports your answer [5 marks]

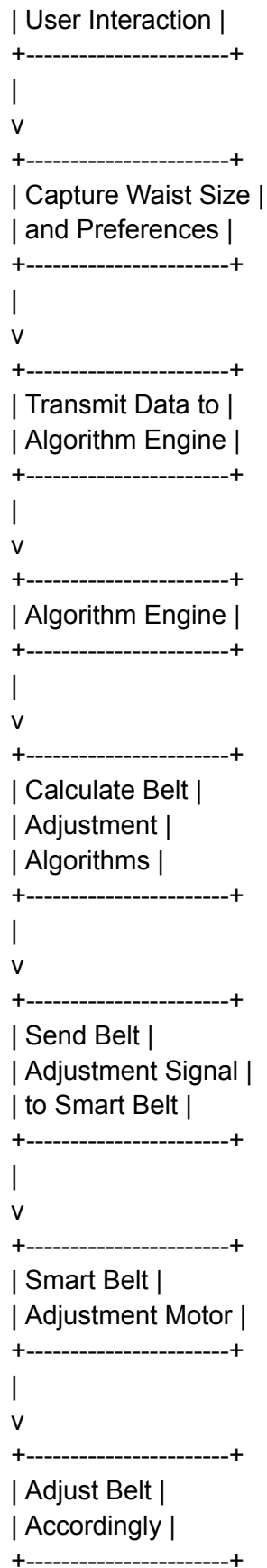
b) I.T. asset management software does more than just create a list. Demonstrate how I.T. managers can use it to determine total cost of ownership (TCO) [3 Marks]

c) List the three factors that influence bandwidth growth as stated by Jakob Nielsen of the Nielsen Bandwidth group [3 marks]

d) "The hospital of the future is in the home" this statement by Sir Bruce Keogh was made in reference to the role the 4th industrial revolution will play in providing technologically advanced healthcare. Support this statement by justifying how analytics and computing will improve healthcare diagnostics, payment and information sharing [3 marks]

e) Clothing technology mobile apps are an emerging trend just beginning to be used in Kenya for common fashion and style related tasks. You have just begun using a new belt app for your trousers. The app's key feature behind its smart clothing tech service is running algorithms that measure the size of your waist and automatically adjust the belt on your trousers to comfortably fit your waistline. Draw a basic system design flow chart modelling the components of how the app works [4 marks]

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f) Name two unique characteristic of DNA digital storage [2 marks]

QUESTION FIVE (20 Marks)

a) Explain what is meant by the term “A.I. snake oil” [2 marks]

b) Technical University of Kenya Learning and Resource Centre (aka Library) has just started an integrated system of lending and returning books within and outside the university. This system will involve the use of smart vehicles and home automation. They will lend books to students in South B hostel. The university self driven smart bus transports books to and from South B student hostels every week. Borrowed books movement and usage are recorded by the system. You have been asked to analyze and evaluate the system. Use the current library and book lending and return process in your analysis and evaluation to determine if the system meets the criteria of an emerging trend or not [5 marks]

c) In his analysis of the characteristics of an emerging trend, the author Rotolo describes a “post-emergence period” which is a phase in every technology’s life cycle chart where it begins to experience changes in the levels of the attributes or characteristics which defined it as an emerging trend. With reference to the emerging trends life cycle chart, use the example of the latest social media app TikTok to predict what this post-emergence phase might look like for TikTok [5 marks]

d) Explain how 4G LTE (Long Term Evolution) is different from 4G [3 marks]

e) The 4th industrial revolution for finance will mean more than just using technology to pay for goods and services, or to send and collect money. Describe how fintech will disrupt the traditional banking business model and increase financial inclusion [3 marks]