



Daffodil International University
Faculty of Science and Information Technology
Department of Computing & Information System (CIS)
Program: B.Sc. in Computing & Information System
Midterm Examination, Semester: Spring-2024

Course Code: MAT 101
Time: 1.5 Hours

Course Title: Mathematics I

Credit Hours: 3.0
Total Marks: 25

Name & Designation of the Examiner: Md. Shakib Hossain (MSH), Lecturer

1.	Explain the concept of Prime factorization, Exponent, and Radical with suitable examples. [CLO-1, PLO-1, C/L-2]	3
2.	List out all the factors of 8064 using prime factorization. [CLO-1, PLO-3, C/L-4]	4
3.	Evaluate the HCF and LCM of 0.63, 10.5, and 2.1. [CLO-1, PLO-3, C/L-5]	4
4.	If $\frac{5^4y-1}{25^y} = \frac{125^y+3}{25^{2-y}}$ then identify the value of y. [CLO-2, PLO-3, C/L-3]	4
5.	Estimate $\frac{dy}{dx}$ using following equation i) $y = \sin^{-1}(e^{\tan^{-1}x})$ ii) $y = x^{x^x}$ iii) $y = t \cdot \sin^{-1}(\ln t)$ and $x = e^t \cdot \operatorname{cosec}(t)$ [CLO-3, PLO-3, C/L-6]	3+3+4

28
 $LCM = \frac{63}{2} \times \frac{21}{10}$
 $HCF = \frac{21}{10}$

$y = -2$

$\frac{e^{\tan}}{(1+y)\sqrt{1+(e^{\tan})^2}}$

$x^x \left[\frac{x^x}{x} + \ln x \right]$
 $x^x \cdot (1 + \ln x)$

$\frac{1}{\sqrt{1-(\ln t)^2}} + \sin^{-1}(\ln t)$
 $\operatorname{cosec}(t) e^t \cdot (1 - \cot(t))$



Daffodil International University

Faculty of Science & Information Technology
Department of Computing and Information System
Mid-Term Examination, Spring-2024

Course Code: ENGI01, Course Title: English I

Level: 1 Term: 1

Exam Duration: 1:30 Hours

Marks: 25

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	<p>a) Listening: Listen to the audio and apply it to answer questions 1 to 10 (Selecting and interpreting ideas; will be taken separately)</p> <p>b) Speaking: A face to face interview with the course tutor (Discuss ideas for topics and explain answer of the questions; will be taken separately)</p>	<p>[Marks 5]</p> <p>[Marks 5]</p>	<p>CLO 2</p> <p>Level 3, 6</p>
2.	<p>a) Identify the Right Form of Verbs from the Parentheses.</p> <p>Road mishap (i). _____ (happen) in our country almost every day. Recently it (ii). _____ (rise) to an alarming rate (iii). _____ (take) a heavy toll of human lives. The members of a family remain anxious if someone travels in a bus. In most cases, reckless driving (iv). _____ (cause) road accidents. The drivers are in the habit of (v). _____ (violate) traffic rules. Road accidents can be lessened if the drivers drive their vehicles carefully.</p> <p>b) Construct the sentences as directed:</p> <p>i. Yesterday at nine, I _____ (have) dinner at home. [Past Continuous Tense]</p> <p>ii. He _____ (live) in Canada since he left school. [Present Perfect Continuous Tense]</p> <p>iii. In ten years' time, you _____ (leave) university and perhaps you will be living in another country. [Future Perfect Tense]</p> <p>iv. Mark _____ (bring) soft drinks to yesterday's meeting. [Past Indefinite Tense]</p> <p>v. I just _____ (have) my lunch. [Present Perfect Tense]</p>	<p>[Marks 2.5]</p> <p>[Marks 2.5]</p>	<p>CLO 1</p> <p>Level 3, 4</p>
3.	<p>Read the passage and answer the following questions.</p> <p style="text-align: center;">The Science of Sleep</p> <p style="text-align: center;">We spend a third of our lives doing it. Napoleon, Florence Nightingale and Margaret Thatcher got by on four hours a night. Thomas Edison claimed it was waste of time.</p>		

So, why do we sleep? This is a question that has baffled scientists for centuries and the answer is, no one is really sure. Some believe that sleep gives the body a chance to recuperate from the day's activities but in reality, the amount of energy saved by sleeping for even eight hours is miniscule - about 50 kCal, the same amount of energy in a piece of toast.

With continued lack of sufficient sleep, the part of the brain that controls language, memory, planning and sense of time is severely affected, practically shutting down. In fact, 17 hours of sustained wakefulness leads to a decrease in performance equivalent to a blood alcohol level of 0.05% (two glasses of wine). This is the legal drink driving limit in the UK.

Research also shows that sleep-deprived individuals often have difficulty in responding to rapidly changing situations and making rational judgements. In real life situations, the consequences are grave and lack of sleep is said to have been a contributory factor to a number of international disasters such as Exxon Valdez, Chernobyl, Three Mile Island and the Challenger shuttle explosion.

Sleep deprivation not only has a major impact on cognitive functioning but also on emotional and physical health. Disorders such as sleep apnoea which result in excessive daytime sleepiness have been linked to stress and high blood pressure. Research has also suggested that sleep loss may increase the risk of obesity because chemicals and hormones that play a key role in controlling appetite and weight gain are released during sleep.

What happens when we sleep?

What happens every time we get a bit of shut eye? Sleep occurs in a recurring cycle of 90 to 110 minutes and is divided into two categories: non-REM (which is further split into four stages) and REM sleep.

Non-REM sleep

i. Stage one: Light Sleep

During the first stage of sleep, we're half awake and half asleep. Our muscle activity slows down and slight twitching may occur. This is a period of light sleep, meaning we can be awakened easily at this stage.

ii. Stage two: True Sleep

Within ten minutes of light sleep, we enter stage two, which lasts around 20 minutes. The breathing pattern and heart rate start to slow down. This period accounts for the largest part of human sleep.

iii. Stages three and four: Deep Sleep

During stage three, the brain begins to produce delta waves, a type of wave that is large (high amplitude) and slow (low frequency). Breathing and heart rate are at their lowest levels.

iv. Stage four:

This stage is characterized by rhythmic breathing and limited muscle activity. If we are awakened during deep sleep we do not adjust immediately and often feel groggy and disoriented for several minutes

after waking up. Some children experience bed-wetting, night terrors, or sleepwalking during this stage.

REM sleep

The first rapid eye movement (REM) period usually begins about 70 to 90 minutes after we fall asleep. We have around three to five REM episodes a night.

Although we are not conscious, the brain is very active - often more so than when we are awake. This is the period when most dreams occur. Our eyes dart around (hence the name), our breathing rate and blood pressure rise. However, our bodies are effectively paralyzed, said to be nature's way of preventing us from acting out our dreams.

After REM sleep, the whole cycle begins again.

How much sleep is required?

There is no set amount of time that everyone needs to sleep, since it varies from person to person. Results from the sleep profiler indicate that people like to sleep anywhere between 5 and 11 hours, with the average being 7.75 hours.

Jim Horne from Loughborough University's Sleep Research Centre has a simple answer though: "The amount of sleep we require is what we need not to be sleepy in the daytime."

Even animals require varied amounts of sleep:

Species	Average Total Sleep Time per Day
Python	18 hours
Tiger	15.8 hours
Cat	12.1 hours
Chimpanzee	9.7 hours
Sheep	3.8 hours
African elephant	3.3 hours
Giraffe	1.9 hour

The current world record for the longest period without sleep is 11 days, set by Randy Gardner in 1965. Four days into the research, he began hallucinating. This was followed by a delusion where he thought he was a famous footballer. Surprisingly, Randy was actually functioning quite well at the end of his research and he could still beat the scientist at pinball.

a) Do the following statements agree with the information in the passage?

[Marks 2.5]

Now write on your answer sheet,

- TRUE if the statement agrees with the information
- FALSE if the statement contradicts the information
- NOT GIVEN if there is no information on this

i. Thomas Edison slept 4 hours a night.

CLO
3
Level
3

	<p>ii. Scientists do not have a certain answer for why we have to sleep. ✓</p> <p>iii. Sleep-deprivation may be the cause of <u>anorexia</u>.</p> <p>iv. <u>Giraffes</u> require less sleep than dogs.</p> <p>v. After four sleepless days, <u>Randy</u> had a delusion about him being a football celebrity.</p>		
	<p>b) Choose the correct letter, A, B, C or D. Write the correct letter on your answer sheet.</p> <p>i. During the <u>Light Sleep</u> stage: <input type="checkbox"/> A. Muscle activity increases <input checked="" type="checkbox"/> B. Jiggling might occur <input type="checkbox"/> C. It is not easy to be woken up <input type="checkbox"/> D. After waking up, one may experience slight disorientation</p> <p>ii. <u>Heart rate</u> is at the lowest level during: <input type="checkbox"/> A. Light Sleep stage <input type="checkbox"/> C. True Sleep stage <input type="checkbox"/> B. Rem Sleep <input type="checkbox"/> D. Third Sleep stage</p> <p>iii. The <u>brain activity</u> is really high: <input type="checkbox"/> A. During REM sleep <input type="checkbox"/> B. During the stage of True Sleep <input type="checkbox"/> C. When we are awake <input type="checkbox"/> D. During the Deep sleep stage</p> <p>iv. <u>Humans require</u> at least: <input checked="" type="checkbox"/> A. 7.75 hours of sleep <input type="checkbox"/> B. 8 hours <input type="checkbox"/> C. 5 hours of sleep <input type="checkbox"/> D. There is no set amount of time</p> <p>v. Pythons need: <input type="checkbox"/> A. Less sleep than tigers <input type="checkbox"/> B. Twice as much sleep as cats <input type="checkbox"/> C. Almost ten times more sleep than giraffes <input checked="" type="checkbox"/> D. More sleep than any other animal in the world</p>	[Marks 2.5]	
4.	<p>a) Blended learning, often referred to as hybrid learning, is an instructional approach that combines digital or online learning materials and activities with traditional face-to-face classroom methods. In its current form, blended learning designates the range of possibilities presented by combining Internet and digital media with established classroom forms that require the physical co-presence of teacher and students. Now, use your own idea and discuss “The Advantages and Disadvantages of Blended Learning”. Your description must include a topic sentence, the body of the paragraph and a concluding statement.</p>	[Marks 5]	CLO 4 Level 4