

KATHMANDU UNIVERSITY  
End Semester Examination [C]  
January 2025

Marks Scored:

Level : B.Sc.

Year : I

Exam Roll No. :

Time: 30 mins.

Registration No.:

Course : BINF 102

Semester : II

F. M. : 10

Date : 12 JAN 2025

SECTION "A"

[20 Q. × 0.5 = 10 marks]

*Choose and encircle in the most appropriate answer. Symbols have their usual meanings.*

- In professional ethics, what does "conflict of interest" refer to?
  - A situation where two professionals disagree
  - A situation where personal interests conflict with professional duties
  - A conflict between ethics and laws
  - A situation involving legal disputes
- Whistleblowing is an example of:
  - Professional misconduct
  - Reporting unethical behavior
  - Violating confidentiality
  - Profit maximization
- Which of the following is the best example of inherited disease?
  - A daughter getting ovarian cancer because her mother had BRCA1 mutation
  - Two brothers suffering from diabetes
  - A father and a son from rural Africa suffering from ringworm disease
  - A mother and a daughter both suffering from blood pressure
- What is one of the issues of biopolitics of GMOs?
  - GMO leads to gene pollution
  - GMO fits the terrain of US better than Europe
  - GMO may be hazardous to human health
  - GMOs were too easily approved by US companies due to influence
- What is Draize test used for?
  - To test whether cosmetics cause irritancy of eye
  - To test whether cosmetics cause reduction in pimples
  - To test for the efficacy of drugs to prevent pimple formation
  - To test efficacy of drugs in eye cosmetics
- What is an example of transdifferentiation?
  - Conversion of muscle tissue from haematopoietic stem cell
  - Generation of multipotent stem cells from oligodendrocytes
  - Differentiation of red blood cells from haematopoietic stem cells
  - Generation of totipotent sheep blastocyst from nuclear transfer
- Which of the following is **NOT** a genetic test:
  - BRCA1 testing to detect variants
  - Urine test to detect the presence of bacteria
  - Whole genome sequencing of new born sick babies
  - Chromosomal abnormality testing for Down's syndrome.

8. What does certain versus potential harm in animal experimentation entail?
  - a. Benefit from experimentation is certain to happen while harm is uncertain
  - b. Nothing is certain neither the harm nor the benefit
  - c. Benefit is uncertain while harm certain from animal experimentation
  - d. There could be benefits and harms from experimenting on animals
9. A \_\_\_\_\_ attack involves breaking into a computer system using known security vulnerabilities to gain access to a cyberspace resource.
  - a. denial-of-service
  - b. penetration
  - c. vendetta
  - d. network
10. \_\_\_\_\_ is an applied science concerned with designing human-machine interactions that offer and maintain a safe, comfortable, healthy, and habitable work environment.
  - a. Economics
  - b. Sociology
  - c. Anthropology
  - d. Ergonomics
11. Security involves these three elements, which one of the following is not among the three elements?
  - a. Confidentiality
  - b. Integrity
  - c. Anonymity
  - d. Availability
12. Cyberbullying, \_\_\_\_\_, and electronic harassment are relatively common occurrences and can often result in emotional trauma for the victim.
  - a. zero trust
  - b. digital signature
  - c. espionage
  - d. cyberstalking
13. Which of the following are desirable characteristics of a “green computer”?
  - a. It runs on less electricity than the typical computer.
  - b. It contains a high percentage of reusable or recyclable materials.
  - c. Its manufacturer has a program to help consumers dispose of it at the end of its life.
  - d. All of the above
14. \_\_\_\_\_ protect inventions or discoveries.
  - a. Copyright
  - b. Trademarks
  - c. Patent
  - d. Trade Secrets
15. Which of the following protects the authors of a book from having their work copied by others?
  - a. Patent protection
  - b. First Sale Doctrine
  - c. Copyright law
  - d. Fair Use Doctrine

***Choose and encircle True or False options for the questions below.***

16. The two primary objectives of social media advertisers should be driving traffic to a Web site to increase product sales and collecting users' data. True or False?
  - a. True
  - b. False
17. All anonymous emails and blog postings are either illegal or unethical. True or False?
  - a. True
  - b. False
18. Using pirated software is an ethical practice as long as it's for personal use. True or False?
  - a. True
  - b. False
19. AI systems can only perform tasks that they were specifically programmed for, without the ability to adapt to new situations. True or False?
  - a. True
  - b. False
20. Professionals in the computing field should prioritize user privacy when designing systems, even if it conflicts with business goals. True or False?
  - a. True
  - b. False

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Level : B.Sc.  
Year : I  
Time : 2 hrs. 30 mins.

21 JAN 2025

Course : BINF 102  
Semester : II  
F. M. : 40

Indicate by checking (✓) of each question you have answered in the cover page of the main answer book.

SECTION "B"

[8Q. × 2 = 16 marks]

Attempt *ANY EIGHT* questions.

1. Briefly discuss the affects of technology on ethics? morality? [2]
2. What are the ethical issues concerned with somatic cell nuclear transplant? [2]
3. Describe some applications of gene therapy. [2]
4. What are synthetic organisms? [2]
5. Discuss the social problems of online social networks. [2]
6. What is your opinion on digital divide and how can it be addressed? [2]
7. Briefly discuss the ethical and legal issues surrounding software ownership. [2]
8. What do you think is the best way to safeguard privacy? [2]
9. What is the ethical implication of distributing pirated software? [2]
10. Why is whistle-blowing so controversial? What are its pros and cons? [2]

SECTION "C"

[3Q. × 4 = 12 marks]

Attempt *ANY THREE* questions.

11. Can there be a common morality? Why or why not? [2+2]
12. What are the strengths and limitations of using copyrights, patents, and trade secret laws in Nepal to protect your intellectual property associated with Information Technology? [2+2]
13. What is the argument of doomed embryos? What is the difference between animal right activist and animal welfare activist? [2+2]
14. There has been a debate on the existence of the digital divide. What is your opinion? Is there one or not? [2+2]

**P.T.O.**

SECTION "D"  
[2Q. × 6 = 12 marks]

Attempt *ANY TWO* questions.

15. Discuss the social and ethical implications of artificial intelligence based on recent developments like ChatGPT, human-like robots, and self-driving vehicles among others. Also, as AI applications are increasing, will the wider use of these “manlike” machines compromise our moral value system? Why or why not?
16. Define professionalism and list three elements of professionalism. Why are the following concepts important for professionalism? Justify your answers.
  - a. Commitment
  - b. Integrity
  - c. Responsibility
  - d. Accountability
17. Case study: Consumer genetic tests for athletic ability

In December 2008, Atlas Sports Genetics began selling a genetic test for ACTN3, the  $\alpha$ -actinin-3 gene. One of the variants in this gene is a nonsense mutation (R577X) that prevents production of the protein. It has been found that individuals with reduced amounts of  $\alpha$ -actinin-3 tend to have a higher proportion of slow twitch muscle fibers than fast twitch muscle fibers. Conversely, because  $\alpha$ -actinin-3 is expressed only in fast twitch muscle fibers, the presence of 1 or 2 copies of the wild type allele of the gene can tilt the physiological balance in favor of fast twitch fibers. This physiological association has been extended to elite athletes to show a modest enrichment of XX genotypes among endurance athletes and RR genotypes among sprint and power athletes. The company advocated testing children, even before their first birthday, as a performance indicator for their future athletic ability. Moreover, they contended that this genetic test is a more accurate prognostic indicator than physical tests before age 9 because these young children have not developed mature motor skills yet. The test results were reported to the families as the client’s “genetic advantage.”

*Questions:*

- a. *Are parents acting in the best interest of their child when performing non-essential genetic tests on them at these young ages?*
- b. *Is it appropriate to base lifestyle decisions about childhood enrichment activities on genetics alone?*
- c. *To what extent can a single gene influence athletic ability?*
- d. *Who are the stakeholders, and what are the morally binding obligations to them based on the principles of autonomy, beneficence, non-maleficence, and justice?*