Enrolment No. _____

AHMEDABAD UNIVERSITY

SCHOOL NAME IN FULL

UNDERGRADUATE / GRADUATE PROGRAMMES

20XX-20YY MONSOON SEMESTER

MID / END SEMESTER EXAMINATION

COURSE CODE COURSE NAME

Date: 21-02-2026 Total Marks: 45

Time: 2 hours: 2:00 pm – 4:00 pm

No. of printed pages: 11 (please include one blank page or sheet of paper at end)

General Instructions:

1. Students must carry their identity card during the examination.
2. No break is allowed during the examination under any circumstances. In case of an emergency, with prior permission of the invigilator and an escort, a break of maximum five minutes is allowed.
3. No unauthorized devices, such as mobile phones, any kind of watches, other gadgets, or any kind of material is allowed on person.
4. Any violation of examination rules and an intent of malpractice will lead to strict disciplinary action, including a possible expulsion from the university.

Course Specific Instructions:

Please answer questions on the question paper itself. All the necessary material is provided.

HST105: Introduction to the History of Biology and Medicine **Student name**
End-semester examination
Feb 21, 2026

Total : 45 points

I. MCQs – 10 pts

Note: In the case of fill-in-the-blanks there is only one correct choice. In other questions in this section you should choose all that apply;

1. Galen was a successful anatomist and surgeon because
   a) He had the opportunity to observe bones and dissections in Alexandria
   b) He performed dissections on a variety of animals
   c) He treated injured gladiators
   d) All of the above
   e) None of above

1 pt

2. Fill in the blanks in this quoted passage from Ibn Sina's *Al Qanun*:
   A humour is a fluid, moist body into which our _____ is transformed. A good humour is such as has the capacity for becoming transformed into actual _____. The _____ from such, the bad humour, does not do this.

1 pt

   a) aliment, body substance, residue
   b) aliment, nourishment, flesh
   c) body fluids, body substance, flesh
   d) flesh, nourishment, residue
   e) food, blood, phlegm

3. Fill in the blanks in this quoted passage:
   ...in the case of things that naturally go bad when exposed to the air, such as milk, meat, etc., we say that they have become corrupt, but not that they have suffered _____ , unless indeed the air itself has also become corrupt in a precisely _____ way.

1 pt

   a) infection, putrescent
   b) contagion, similar
   c) putrefaction, similar
   d) contagion, infectious
   e) putrefaction, putrescent

4. Fill in the blanks in this quoted passage:
   It would therefore appear that the function of the valves in the _____ is [to] *prevent all _____ of the blood that is passing over them*.

1 pt

   a) arteries, flow
   b) arteries, reflux
   c) veins, clotting
   d) veins, flow
   e) veins, reflux

5. Which of the following statements best represents Harvey's conclusions (accurate even by today's standards) about the functions of the blood vessels?

a) Veins transport impure blood to the heart, and arteries transport purified blood from the heart to other parts of the body
b) Veins bring deoxygenated blood to the heart and arteries distribute oxygenated blood from heart to other parts of the body
c) Veins carry blue blood to the heart and arteries carry red blood away from the heart
d) All of the above
e) Harvey would not have been in a position to make any of the above conclusions

1 pt

Bonus point (only if you get # 3 correct): Which of the above statements (a, b, or c) though valid today, represents an anachronism in relation to Harvey?

6. Leeuwenhoek was able to discover bacteria because

a) He had observed Robert Hooke's microscopic demonstrations at the Royal Society in London
b) His position as a clothes-merchant had familiarized him with the use of microscopes
c) He was a very curious individual and subjected many materials to microscopic observation
d) All of the above
e) None of the above.

1 pt

7. Fill in the blanks in this quoted passage:
Man does not actually produce variability;[but he] *can select* _____ *given to him by* _____ *, and thus* _____ *them in any desired manner*.

a) combinations, mutations, accumulate
b) populations, evolution, combine
c) traits, nature, change
d) variations, mutations, distribute
e) variations, nature, accumulate

1 pt

8. What principles/factors did Darwin consider to be important in the evolution of new species?

a) Natural variability among individuals of species
b) Competition (for resources)
c) Divergence from common ancestors
d) All of the above
e) None of above

1 pt

Bonus point if you can define what a species was in Darwinian times:

9. Fill in the blanks in this quoted passage:

_____ is the process by which new species are brought into existence. It is the process of interaction between: changes in the _____ ; _____ between, and within, species; and the _____ naturally occurring within species… driven by the _____of procreation over the numbers the environment can support.

2 pts

9a. Fill in the first blank yourselves: i.e name the process

9b. Choose the correct combination of terms as in previous fill-in-blank questions:

a) atmosphere, infighting, variation, need
b) atmosphere, changes, selection, shortage
c) climate, selection, infighting, excess
d) environment, variation, changes; shortage
e) environment, competition; variation; excess

II. Tables – 10 pts

1. Do you think the discoveries and advances in column 1 were necessary, sufficient, or neither for the discovery of living micro-organisms? (Check the appropriate box (or boxes), leaving them both blank if you believe they were neither necessary nor sufficient):

5 pts

	Necessary	Sufficient	Why/why not
The microscope			
Miasmatic theory			
Refutation of spontaneous generation			
Idea that living things moved			
Process of fermentation			

2. How about the germ theory of disease? Which discoveries and connections were necessary, sufficient or neither for it ?

5 pts

	Necessary	Sufficient	Why/why not
The microscope			
Miasmatic theory			
Idea that living things moved			
Demonstration of microbes performing fermentation*			
Observation that fermentation occurred in blood or wounds			

**Bonus* point for identifying the scientist who made this important link:

III. Short Answers – 25 pts

1. Although the Hippocratics believed in gods, they did not ascribe divine intervention to diseases of the brain and mind, claiming in fact that epilepsy was not "any more divine or sacred than any other disease" (*The Sacred Disease* Ch. 1). Do you think that Muslim doctors, whose prophet preached that *Allah has not made a disease without appointing a remedy for it, with the exception of one disease: old age* (as quoted by Palleja de Bustinza p. 67), would have agreed with this claim about epilepsy? Explain how the Arab-Islamic belief system would have matched or contradicted the Hippocratic idea?

2 pts

HST105 2026 Mindmap

Galen
- Function of veins and arteries
- Performed vivisections

Overturned

Harvey
- Motion of the heart
  - Moves through contraction and expansion
- Action of heart
- Study of valves
  - Difference in veins and arteries

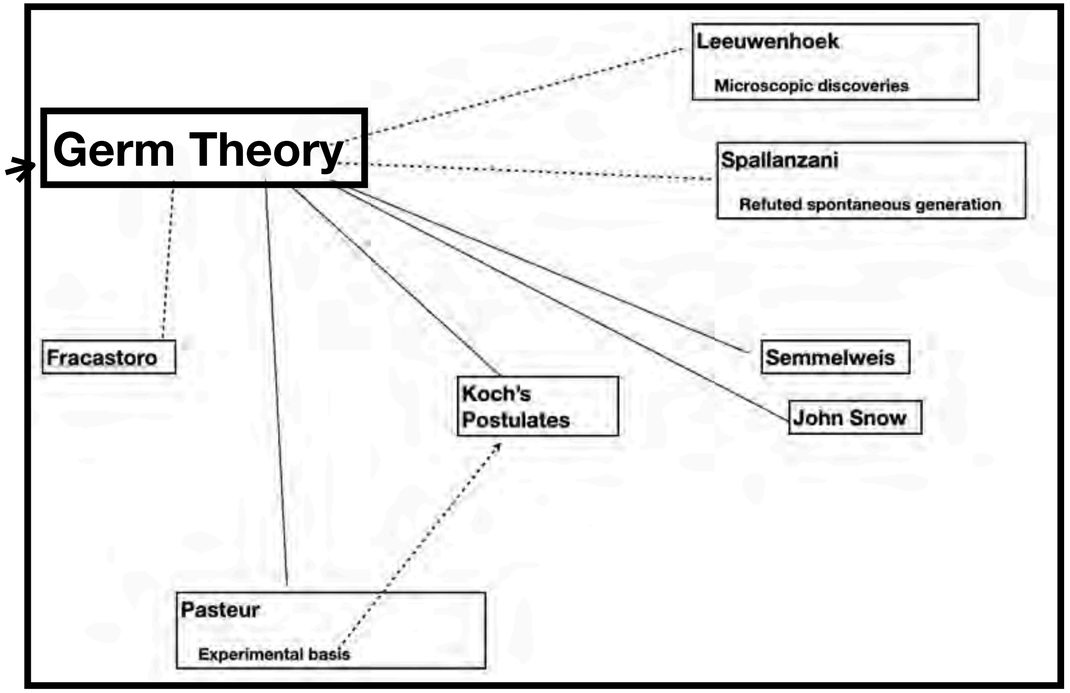
Humoral theory (influence)

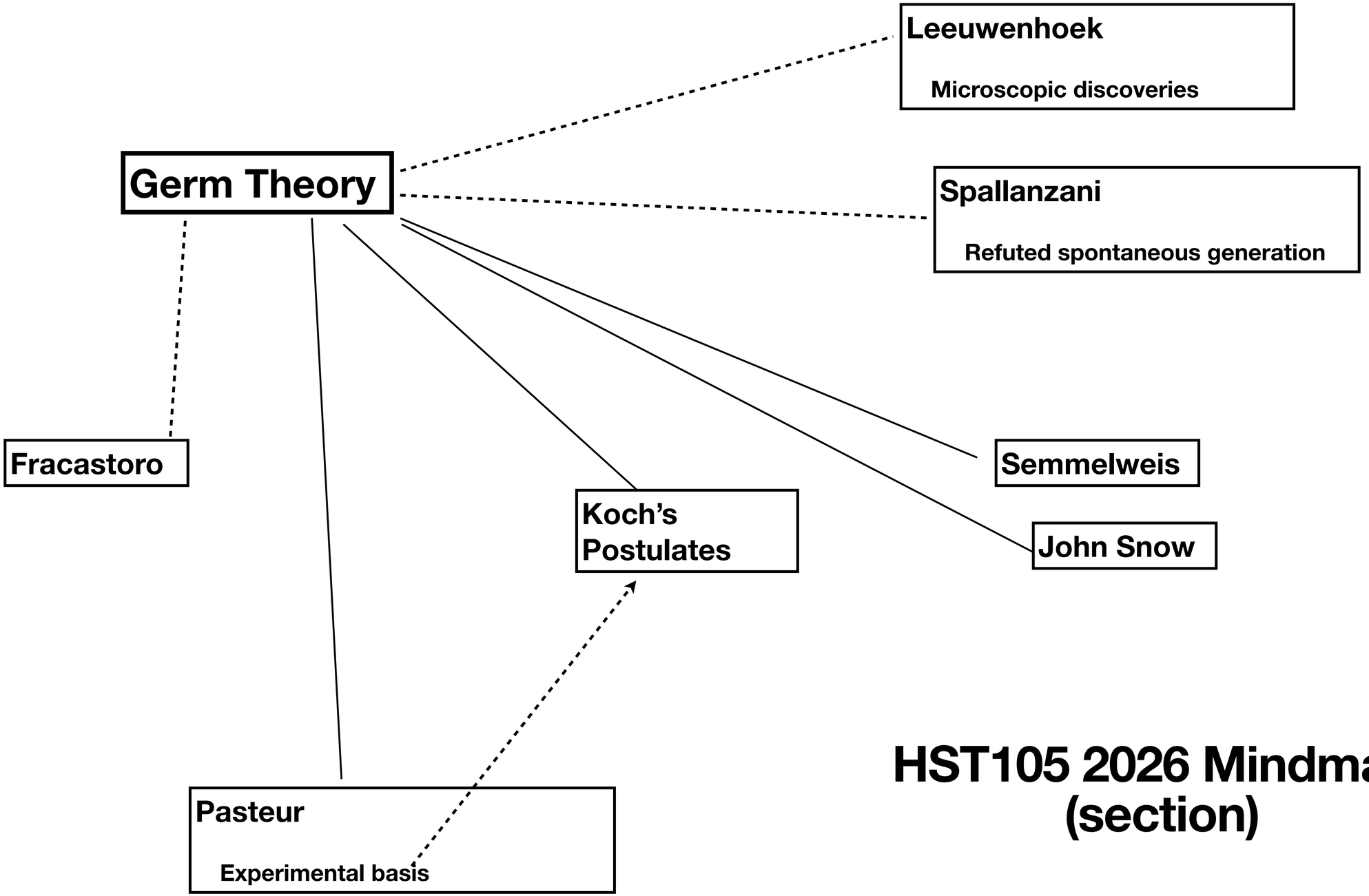
Translations

Islamic medicine
- Hospitals & Universities
- Avicenna (aka Ibn Sina) — *Al Qanun fi Tibb* Encyclopedia
- Experimental observations (added to commentaries in translations)

Darwin
- *Origin of Species*
- Evolution by Natural selection
- Debunking misconceptions about evolution

Black Death





HST105 2026 Mindmap (section)

2. Identify one example from the history of biology or medicine that you studied this semester where a clearly non-scientific factor–social, professional, world event–had a major impact on a scientific discovery or advance. (*Question courtesy one of your classmates*)

1 pt

3. The idea that "miasma" or bad air caused and spread infectious diseases held sway for a long time, although ideas about the mechanism by which it could do so were quite variable. What does the medieval practice of using fragrant herbs in the plague masks tell you about what people in that time period believed the disease and contagious principle to be?

1 pt

What would be the independent and dependent variable to test this theory and how would you measure them (*Don't blame me for this question–it came from three of your classmates!)*

4 pts

Independent

Measurement

Dependent variable

Measurement

4. The usefulness of analogy—or the comparison of a phenomenon or process, e.g. a disease, or a natural phenomenon to a more familiar or common process drawn from daily life— in different branches of science has been demonstrated more than once, especially in the second half of this course. Identify and explain the way in which the following historical figures used analogies to support or explain their theories?

6 pts

a) Fracastoro

Scientific or medical phenomenon explained:

Common/familiar process to which analogy was drawn:

Explanation, i.e. how he used the analogy

Bonus point for identifying a different way in which Fracastoro himself used the word "analogy"

b) Charles Darwin

Scientific or medical phenomenon explained:

Common/familiar process to which analogy was drawn:

Explanation, i.e. how he used the analogy

5. The mind-map you generated shows connections between Galen and both the Islamic doctors such as Ibn Sina as well as with William Harvey. What would you say is the major difference in the relationship between the relationship of the ideas and findings of these two men with the work and ideas of Galen?

2 pts

Bonus point for identifying the Islamic physician who proposed an alternative to Galen's idea of circulation that predated Harvey by some centuries:

6. (*And yet another one from one of your classmates*): Although the mind map Darwin's theory of evolution and the germ theory are largely separate from and unrelated to one another there may be some ways in which they are compatible with one another and others in which they actually rely on conflicting world views. Identify an example of each.

2 pts.

Compatibility:

Conflicting worldviews:

8. The findings of both Semmelweis and Snow demonstrate one specific mode of contagion described by Fracastoro in the middle ages; What is that mode and what specific entities were identified by each of these physicians as responsible for spreading disease?

3 pts

9. Two observations that are often used to counter or support a disbelief in evolution include: “Man did not descend from monkeys” and “The fact transitional species such as crocoducks [or dino-apes or leaf-eared frogs] do not exist means evolution is not true,” rely on a common principle of evolution laid out by Darwin. What is that principle? Identify the passage from the *Origin of Species* listed below that best describes this principle and use it to refute each of the statements.

Excerpts from *The Origins of Species* by Charles Darwin

A. Artificial selection has had a marked effect on the form of domesticated plants and animals, although it has only been applied for a small number of generations […] There is no obvious reason why the principles which have acted so efficiently under domestication should not have acted under nature.

B. [Every generation] more individuals are born than can possibly survive. The slightest advantage in one being, at any age or during any season, over those with which it comes into competition ... will turn the balance.

C. If a change occurs in the physical environment, all individuals will be exposed to new circumstances, and compete for survival. These changes will favor the transmission of features that are advantageous in the new conditions.

D. In any new environment there will be different conditions from place to place. Individual variations will be favoured by particular sets of circumstances, and this will give rise to the tendency for varieties to become more distinct through successive generations.

4 pts