Фізико-технічний факультет
Зразок поточної контрольної роботи «Іноземна мова професійного спрямування»

Task I. For questions (1-5) choose the correct answer (A, B, C or D).

ELECTROMAGNETIC WAVES

(1) Electromagnetism is defined as the combinations of alternating electric and magnetic fields created by accelerated charges that propagate out from these charges at the speed of light in the form of waves – electromagnetic waves or radiation. The Earth's environment is widely affected by various types of radiation – power waves, radio waves, microwaves, infrared, visible, ultraviolet, X-rays and gamma rays.

(2) The phenomena associated with electricity and magnetism were studied over most of the 19th century. The knowledge that the two fields were interdependent began with the fantastic discovery by Hans Christian Quersted in the early 1820s. He learnt that magnetism is ultimately caused by moving electric charges or current, when he observed a magnetic compass needle to react to a current flowing through a wire placed near it.

(3) Later on the simultaneous though separate discoveries made by Michael Faraday and Joseph Henry concerning electromagnetic induction in the 1830's led to the theory of James Clerk Maxwell, which united electricity, magnetism and optics into one grand theory of light: the explanation of electromagnetic waves.

(4) The best source of electromagnetic waves is accelerated waves. An accelerated charge is one that is increasing or decreasing its speed or changing its direction of motion or both. Let us imagine two charges at rest in the vicinity of each other. They are immersed in each other's electric force field. If one charge suddenly begins to oscillate up and down, the second charge experiences the change in the field of the first charge after some very small finite time elapses. The oscillating charge was accelerated. The moving charge's electric fields change, as do their magnetic fields. These changing electric and magnetic fields generate each other through Faraday's law of induction and Ampere's law. These changing fields dissociate from the oscillating charge and propagate out into space at the speed of light.

(5) Electromagnetic waves travel at the speed of light in vacuum, but they travel more slowly when they pass through various media such as air, glass, and water. The relationship among frequency, wavelength and speed exists for electromagnetic waves; the product of frequency and wavelength equals the speed of light. Thus, wavelength and frequency are inversely related. Since life on the Earth is bathed constantly in all forms of electromagnetic radiation, scientists must be aware of the potential risks, as well as benefits of exposures to electromagnetic waves.

1. Electromagnetism is …
   a) the power of electrically charged particles interaction.
   b) the acceleration of charges in a discharge tube.
   c) the propagation of waves in space.
   d) the theory of light.

2. Hans Christian Quersted was the first who discovered …
   a) electromagnetic waves.
   b) the cause of magnetism.
   c) alternating electric current.
   d) the speed of light.

3. James Maxwell's theory was …
   a) the beginning of electromagnetism
   b) the branch of optics.
   c) the development of gamma rays theory.
   d) the result of previous discoveries.

4. An accelerated charge can change …
   a) its speed and direction.
   b) such medium as glass.
   c) radio waves.
   d) a direct charge.

5. The fastest speed of electromagnetic waves is …
   a) in air.
   b) in salt water.
   c) in vacuum.
   d) in water.

Task II. Read the text. For statements (6-10) choose "True" if the statement is true according to the text, "False" if the statement is false:

6. Electromagnetism is the physics of the electromagnetic field exerting a force on charged particles.
7. Hans Christian Quersted was the first to discover electromagnetism.
8. Michael Faraday and Joseph Henry made the discovery of electromagnetic induction.
9. The origin of the electromagnetic waves is microwaves.
10. When one charge starts to vibrate, the second one undergoes the influence of the magnetic field.

Task III. Read the text and fill in the gaps (11 – 20) with an appropriate word.

After the photon hypothesis had proven to be true, many physicists tried to (11) _____ the two views, how it is possible that light behaves as a kind of a wave, whereas it consists of quanta or particles that have energy and (12) _____. While these (13) _____ were not successful, another view emerged. L. de Broglie a French physicist (14) _____the hypothesis that perhaps the behaviour of the electrons in atoms can be explained, if one (15) _____ that electrons – that were known to be massive particles and possessing well defined negative (16) – might also behave like waves. Later on, this was proven experimentally by G.P.Thomson, and (17)_____ by Davisson. The (18) _____ that an electron just like photons can behave either as a particle or as a wave is called duality. This very unexpected property was resolved by Max Born in 1926 by purely theoretical arguments. But before explaining Born's idea, let us turn to an experiment (19) _____ explicitly the duality property. This is the famous double (20) _____ experiment – one of the most interesting experiments in physics – first performed with electrons by Clauss J¨onsson in 1961 and popularized later by Akira Tonomura.

11	mix	reconcile	popularize	possess
12	momentum	experiment	magnitude	electron
13	attempts	trials	research	datum
14	join in	reveal	set up	perform
15	consumes	assumes	avoids	reads
16	momentum	sphere	charge	electron
17	independently	dependently	reasonably	applicably
18	sum	simplicity	understanding	property
19	reconciling	revealing	simplifying	experimenting
20	slit	turn	split	proof

Task IV. Choose the correct option (21 – 40).

21. I _____ always _____ busy. I wish I _____ more free time
A. will be, such a, will have
B. have been, such, would be
C. were, so, have
D. am, so, had

22. _____ we are a small company, we _____ almost a hundred machines _____ month.
A. Although, sell, a
B. Despite, buy, the
C. In case of, purchase, in
D. Provided, loan, −

23. _____ of _____ restaurants we went _____ were expensive.
A. Any, the, at
B. Some, the, upon
C. Neither, the, to
D. Either, −, to

24. If you _____ your boss, I'm sure he _____ your _____.
A. asked, would have considered, advice
B. will ask, would consider, consideration
C. had asked, would have considered, proposal
D. would have asked, had considered, suggestion

25. I wish I _____ more at school. I _____ a better _____ now.
A. had studied, would probably have, job
B. had studied, would probably have, work
C. studied, would probably have had, job
D. study, would probably have, work

26. Mike can't _____ the car, he _____ the keys. Peter must _____ it.
A. have taken, hasn't got, have taken
B. has taken, hasn't got, has taken
C. be taking, gets, take
D. take, will get, would be taking

27. If I _____ how long the journey _____, I _____ something else to read with me.
A. would have known, is, had taken
B. had known, was, would have taken
C. know, is, would have taken
D. knew, will be, would be taking

28. If you _____ so stubborn you _____ it a lot _____ to keep your friends.
A. wouldn't be, would find, the easiest
B. hadn't been, would find, easy
C. are not, will find, easy
D. were not, would find, easier

29. I'm sorry you _____ your exam, _____ you _____ harder.
A. failed, but, should have worked
C. fail, despite, have to work

B. have fail, in order to, must have worked
D. failed, although, might be working

30. I hate _____ _____ buses. I wish I _____a car.
A. to travel, on, would have
C. travelling, by, would have had
B. travelling, by, had
D. to travel, on, have

31. He could remember _____ along the road just before _____accident, but he couldn't remember the accident _____.
A. driving, the, itself
C. driven, the, his
B. to drive, **−,** himself
D. been driven, the, itself

32. I'm tired. I'd rather not _____ this evening, if you _____.
A. will go out, didn't mind
C. go out, don't mind
B. have gone out, didn't mind
D. to go out, don't mind

33. I wish we _____ to _____Malta for our holidays. Greece _____ better, I think.
A. hadn't gone, −, would have been
C. wouldn't go, the, would be
B. didn't go, the, would be
D. wouldn't have gone, −, had been

34. Our boss _____ he doesn't approve _____ the changes. He's totally _____ them.
A. speaks, against, of
C. speaks, −, of
B. tells, against, of
D. says, of, against

35. You _____ a great party yesterday. You _____.
A. missed, must be coming
C. have missed, should come
B. have missed, had to come
D. missed, should have come

36. We'd better _____ for petrol soon. _____ tank _____ almost empty.
A. stop, The, is
C. have stopped, A, will be
B. to stop, −, is
D. will stop, the, will be

37. After _____ of trying, we finally succeeded _____ _____ them.
A. months', at, persuading
C. months, on, to persuade
B. month, in, persuading
D. months, in, persuading

38. _____ the film twice, I _____to go to _____ cinema.
A. Seen, didn't want, the
C. Seeing, don't want, a
B. Having seen, didn't want, the
D. Being seen, don't want, −

39. He _____ to get a taxi _____ I gave him _____ lift.
A. didn't need, because, a
C. shouldn't, while, the
B. mustn't, as, −
D. didn't have, so, a

40. I _____ to live in Spain _____ 1993. Next year I _____ here 20 years.
A. came, in, will have been
C. came, at, will be
B. will come, in, will have been
D. come, on, have been