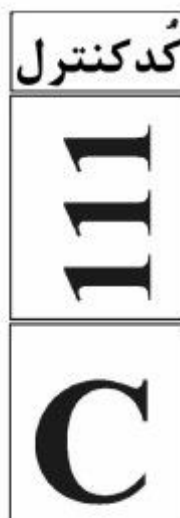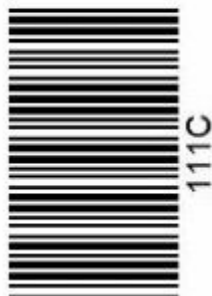**کامل ترین منبع واژگان زبان عمومی کارشناسی ارشد**

کُدکنترل

۱۱۱

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نام:

نام خانوادگی:

محل امضا:

صبح پنجشنبه
۹۶/۲/۷

«اگر دانشگاه اصلاح شود مملکت اصلاح می‌شود.»
امام خمینی (ره)

جمهوری اسلامی ایران
وزارت علوم، تحقیقات و فناوری
سازمان سنجش آموزش کشور

آزمون ورودی دوره‌های کارشناسی‌ارشد ناپیوستهٔ داخل ـ سال ۱۳۹۶

مجموعه مهندسی برق ـ کد ۱۲۵۱

تعداد سؤال: ۱۳۸   مدت پاسخگویی: ۲۷۰ دقیقه

عنوان مواد امتحانی، تعداد و شمارهٔ سؤالات

تا شماره	از شماره	تعداد سؤال	مواد امتحانی	ردیف
۳۰	۱	۳۰	زبان عمومی و تخصصی (انگلیسی)	۱
۴۵	۳۱	۱۵	ریاضیات (معادلات دیفرانسیل، ریاضیات مهندسی، آمار و احتمالات)	۲
۶۰	۴۶	۱۵	مدارهای الکتریکی (۱و۲)	۳
۷۵	۶۱	۱۵	الکترونیک (۱و۲) و سیستم‌های دیجیتال ۱	۴
۹۰	۷۶	۱۵	ماشین‌های الکتریکی (۱و۲) و تحلیل سیستم‌های انرژی الکتریکی ۱	۵
۱۰۲	۹۱	۱۲	سیستم‌های کنترل خطی	۶
۱۱۴	۱۰۳	۱۲	سیگنال‌ها و سیستم‌ها	۷
۱۲۶	۱۱۵	۱۲	الکترومغناطیس	۸
۱۳۸	۱۲۷	۱۲	مقدمه‌ای بر مهندسی پزشکی	۹

این آزمون نمرهٔ منفی دارد.

استفاده از ماشین‌حساب مجاز نیست.

PART A: Vocabulary
Directions: Choose the word or phrase (1), (2), (3), or (4) that best completes the blank. Then mark the correct choice on your answer sheet.

1- Lawyers for both parties will convene this morning to see if a --------- can be reached before the matter reaches the court.
   1) transparency   2) realism   3) settlement   4) discipline

2- Later he --------- her daughter for having talked to her teacher impolitely.
   1) prevented   2) scolded   3) restricted   4) neglected

3- The volcano had remained --------- for over a hundred years, and most people thought it would never burst again.
   1) dormant   2) drastic   3) severe   4) incidental

4- You will certainly --------- your sprained ankle if you attempt to play basketball today.
   1) coerce   2) avoid   3) discomfit   4) exacerbate

5- My medical condition is --------- and cannot be altered even with medication.
   1) immutable   2) exhaustible   3) durable   4) demanding

6- The comedian hoped his jokes would --------- a great deal of laughter from the audience.
   1) pursue   2) explode   3) necessitate   4) elicit

7- Because Kelly's parents were not affectionate, she grew up suffering from a/an --------- of love and affection.
   1) isolation   2) malfunction   3) violation   4) deprivation

8- Although we may never completely --------- every disease on earth, it's heartening to see the progress medicine has made on so many fronts.
   1) overlook   2) eradicate   3) suspend   4) forecast

9- As people mature, their --------- skills become more developed, so they are capable of solving more complex problems.
   1) collective   2) sufficient   3) cognitive   4) hypothetical

10- I wonder why Cathy spends so much time telling me --------- facts that have nothing to do with me.
   1) curious   2) identical   3) irrelevant   4) unequivocal

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PART B: Cloze Passage
Directions: Read the following passage and decide which choice (1), (2), (3), or (4) best fits each space. Then mark the correct choice on your answer sheet.

The job of theoretical physicists is twofold: first, to explain what our experimental colleagues have discovered; and second, (11) --------- phenomena that have not yet (12) ---------. The history of scientific discovery shows that progress is achieved using (13) ---------.

Quantum theory, for example, was largely driven by empirical results, (14) --------- Einstein's general theory of relativity was (15) --------- speculation and thought experiments, as well as advanced mathematics.

11- 1) to predict   2) predicting   3) it is to predict   4) predict
12- 1) found   2) to be found   3) been found   4) be found

13- 1) both the methods   2) both methods   3) both of methods   4) methods both
14- 1) as though   2) in that   3) so that   4) whereas
15- 1) a product of   2) produced   3) production of   4) producing

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PART C: Reading Comprehension:
**Directions:** Read the following three passages and answer the questions by choosing the best choice (1), (2), (3), or (4). Then mark the correct choice on your answer sheet.

PASSAGE 1:

Giant magneto-resistance (GMR) is a quantum mechanical magneto-resistance effect observed in thin-film structures composed of alternating ferromagnetic and non-magnetic conductive layers. The effect is observed as a significant change in the electrical resistance depending on whether the magnetization of adjacent ferromagnetic layers is in a parallel or an anti-parallel alignment. The overall resistance is relatives for parallel alignment and relatively high for anti-parallel alignment. The magnetization direction can be controlled for example, by applying an external magnetic field. The effect is based on the dependence of electron scattering on the spin orientation. GMR in films was first observed by Fert and Gruenberg in a study of super-lattices composed of ferromagnetic and anti-ferromagnetic layers. The main application of GMR is magnetic field sensors, which are used to read data in hard disk drives. GMR multilayer structures are also used in magneto resistive random-access memory (MRAM) as cells that store one bit of information.

A cell of magneto resistive random-access memory (MRAM) has a structure similar to the spin-valve sensor. The value of the stored bits can be encoded via the magnetization direction in the sensor layer; it is read by measuring the resistance of the structure. The advantages of this technology are independence of power supply (the information is preserved when the power is switched off owing to the potential barrier for reorienting the magnetization), low power consumption and high speed.

In a typical GMR-based storage unit, a CIP structure is located between two wires oriented perpendicular to each other. These conductors are called lines of rows and columns. Pulses of electric current passing through the lines generate a vortex magnetic field, which affects the GMR structure.

16- **According to the passage, what is the justification for the designation GMR?**
   1) The large magnetic field required to change the resistance of the sensor.
   2) The complex underlying physics of resistance change in sensors.
   3) The big size of the magnetic sensors.
   4) The resistance change produced in response to a magnetic field.

17- **According to the passage, which of the items below can be considered as a major application of the GMR sensor?**
   1) Sensing magnet flux   2) Sensing resistance
   3) Sensing thin film structvre   4) Sensing superlattice structures

18- **In the passage, the underlined word "oriented" can best be replaced with -----------.**
   1) Turned   2) lying
   3) twisting   4) Modified

19- **Which of these components is not used in the structre of a GMR?**
1) Non-magnetic conductors
2) Thin films
3) Anti-ferromagnetic insulators
4) Magnetic conductors

20- **What would be a good title for the passages?**
1) Giant Magneto Resistance theory
2) Application of GMR in memories
3) Measuring the resistance of structures
4) Magnetic fields in quantum mechanics

PASSAGE 2:

Electrons play a fundamental role in electronics. They are commonly manipulated based on the two properties: charge and spin. Electronics has long exploited the charge of electrons to make devices that can turn on or off. More recently, we have also seen the spin of electrons <u>leveraged</u>. Encoding bits using the spin of electrons, instead of the usual charge is a promising potential for spintronic devices. Electron spin can be visualized as the rotation of an electron in one of two ways, with the rotation axis pointing up or down. Just as the presence or absence of on electric charge represents a bit equaling 1 or 0, a spin pointing up or down can do so as well. Flipping the spin to change a bit requires much less energy than moving charge. Spintronics has been held out as a way to greatly increase data processing speeds. However, quantum spin can be impacted by magnetic fields, which leads to stability problems for spintronics.

Both electronics and spintronics have their own strengths and weaknesses. Hence, researchers have focused on finding another degree of freedom in electrons that avoids those weaknesses and maximizes the strengths. Instead of relying on the electrons' spin or charge, valleytronics exploits their energy level in relation to their momentum. The "valley" in valleytronics comes from the shape of the graph you get when you plot the energy of electrons relative to their momentum: the resulting curve features two valleys. Electrons move through the lattice of a 2D semiconductor as a wave populating these two valleys, with each valley being characterized by a distinct momentum and quantum valley number. The trick is to manipulate these two valleys so that one is deeper than the other, which causes the electrons to populate one valley more than the other. When the electrons are in a minimum energy valley, the quantum valley number associated with it can be used to encode information.

21- **The passage mainly talks about** ------------.
1) Recent developments in electronics
2) Traditional transistors
3) The strengths and weaknesses of valleytronics
4) Quantum theory and its applications

22- **One advantage of spintronics over electronics is** --------------.
1) The orientation of electron charges
2) The requirement to move charges
3) Energy efficiency
4) The impact of magnetic fields on quantum spin

23- **It can be inferred from the passage that -------------.**
1) Changing electron population of valleys takes place at a lower energy level
2) Using electron charges is outdated these days
3) In valleytronics, the valleys are polarized
4) Data processing takes place faster with spintronics

24- **Which characteristic distinguishes valleys from each other?**
1) Electron spin   2) Momentum
3) Encoded information   4) Graph shape

25- **Encoding bits in the three systems discussed in the passage does NOT take place in**
1) Electron spins   2) Valley   3) Binary digits   4) Electron charges

PASSAGE 3:

Telecrnmunications corporations are faced with increasing load on the connectivity service providers (CSP) networks due to rapid growth in the use of internet of thing (IoT) devices. In most applications, the CSP role is confined to providing the network access (e.g., SIM cards) and a long-term data plan. As traffic becomes more unpredictable, CSPs have little visibility into devices, applications or management of machine-generated traffic impacting their ability to deliver the appropriate quality of service (QoS).

At the enterprise level, business units struggle to implement and capitalize on the promise of IoT by extending or strengthening their activities by adding a telecommunications link to and from some of the products that they sell.

Municipalities often have several agencies (e.g., Police, Transport, Tourism, IT and Infrastructure) wishing to deploy devices and sensors into the city to provide new services to the citizens, optimize their operations or reduce costs. Unfortunately, these different units work in isolation from each other, by focusing on their own vertical needs. This hinders efficient development and operations, as it leads to high development costs, little commonality, and little reusability in essence creating custom solutions for each vertical.

With the rapid development of opportunities in the IoT marketplace, organizations are challenged in developing business-specific solutions while ensuring maximum reusability across their organization and business units.

Fragmentation in the IoT industry, rooted in <u>disparate</u> devices and applications built on proprietary protocols can stifle innovation. This complex ecosystem makes it harder for application developers to innovate and create new applications cost effectively. In the Telco, enterprise, and municipal space, the effects of this complexity are felt in different ways.

26- **The underlined word "disparate" in the last paragraph means -----------.**
1) Different   2) Opposite   3) Reusable   4) Manufactured

27- **According to the text, what does IoT motivate at the enterprise level?**
1) To increase the load on connectivity service providers
2) To make municipalities have a stronger role in providing the QoS in telecommunications services
3) To increase the number of SIM cards
4) To equip devices with communication capabilities

28- **We may conclude from the passage that -------------.**
1) QoS can be improved by multiplication of IoT devices
2) Fragmentation in the IoT facilitates innovations
3) Innovation is hampered by exclusive rights and natures of IoT protocols
4) An efficient deployment of the network may result from agencies focusing on their vertical needs

29- **CSPs have lost in their service quality due to --------------.**
1) Reduced visibility of CSPs
2) Efforts by telecommunications corporations to reduce cost
3) Rapid growth of IoT
4) Increasing load of CSP networks

30- **What is meant by "custom solution" in the third paragraph?**
1) Those conventionally used in IT problems
2) Those uniting otherwise isolated agencies
3) Those addressing the commonalities of IoT applications
4) Those addressing specific verticals

شماره سوال	گزینه صحیح	شماره سوال	گزینه صحیح	شماره سوال	گزینه صحیح	شماره سوال	گزینه صحیح	شماره سوال	گزینه صحیح
1	3	31	2	61	2	91	2	121	2
2	2	32	1	62	3	92	2	122	4
3	1	33	2	63	1	93	1	123	3
4	4	34	3	64	2	94	1	124	2
5	1	35	4	65	3	95	3	125	4
6	4	36	4	66	1	96	4	126	1
7	4	37	1	67	1	97	4	127	4
8	2	38	2	68	4	98	3	128	1
9	3	39	3	69	3	99	3	129	2
10	3	40	1	70	3	100	4	130	1
11	1	41	2	71	2	101	2	131	2
12	3	42	4	72	4	102	1	132	2
13	2	43	1	73	1	103	2	133	3
14	4	44	4	74	1	104	3	134	4
15	1	45	3	75	1	105	4	135	4
16	4	46	3	76	4	106	1	136	3
17	1	47	1	77	4	107	3	137	1
18	2	48	2	78	2	108	4	138	1
19	3	49	4	79	4	109	4		
20	2	50	1	80	1	110	4		
21	1	51	1	81	3	111	1		
22	3	52	1	82	3	112	2		
23	4	53	2	83	1	113	1		
24	2	54	3	84	4	114	2		
25	3	55	1	85	3	115	3		
26	1	56	3	86	3	116	1		
27	4	57	4	87	1	117	2		
28	3	58	4	88	1	118	1		
29	2	59	4	89	4	119	3		
30	4	60	2	90	2	120	4		