



UNIVERSITI SAINS MALAYSIA

Second Semester Examination  
2016/2017 Academic Session

June 2017

**EUP222 – Engineers in Society**  
***[Jurutera Dalam Masyarakat]***

Duration : 3 hours  
*[Masa : 3 jam]*

Please check that this examination paper consists of **TWENTY SIX (26)** pages of printed material before you begin the examination.

*[Sila pastikan bahawa kertas peperiksaan ini mengandungi **DUA PULUH ENAM (26)** muka surat yang bercetak sebelum anda memulakan peperiksaan ini.]*

**Instructions** : This paper contains **FOUR (4)** parts. Answer **ALL** questions.

**Each part must be answered in a separate booklet.**

Parts A, B, C & D - Compulsory

Part C - Answer on OMR

**[Arahan** : Kertas ini mengandungi **EMPAT (4)** bahagian soalan. Jawab **SEMUA** soalan. **Setiap bahagian mesti dijawab dalam buku jawapan yang berasingan.**

*Bahagian A, B, C & D Wajib jawab*

*Bahagian C - Jawab di atas kertas OMR*

You may answer the question either in Bahasa Malaysia or English.

*[Anda dibenarkan menjawab soalan sama ada dalam Bahasa Malaysia atau Bahasa Inggeris.]*

All questions **MUST BE** answered on a new page.

*[Semua soalan **MESTILAH** dijawab pada muka surat baru.]*

In the event of any discrepancies, the English version shall be used.

*[Sekiranya terdapat percanggahan pada soalan peperiksaan, versi Bahasa Inggeris hendaklah diguna pakai.]*

**PART A/BAHAGIAN A****Compulsory to answer all questions.*****Wajib menjawab semua soalan.***

1. [a] Selection process is one of the key procedures involved in staffing/recruitment through interviews. Briefly explain how do you convince the interviewer if a question on “how you see yourself in 3-5 years from now” being highlighted in the interview.

*Proses pemilihan ialah salah satu prosedur utama yang terlibat dalam pengambilan kakitangan/pekerja melalui temu bual. Terangkan secara ringkas bagaimana anda dapat meyakinkan penemuduga jika soalan mengenai "bagaimana anda cerminkan diri anda dalam 3-5 tahun dari sekarang" ditonjolkan dalam temu bual tersebut.*

[10 marks/markah]

- [b] As an employer, “a friendly manner communication” is one of the feasible ways to solve problems of the employee, either personal or work-related. Describe how this type of communication can be delivered effectively and efficiently in the real practice.

*Sebagai seorang majikan, "komunikasi cara mesra" ialah salah satu daripada cara yang munasabah untuk menyelesaikan masalah pekerja, samada berkaitan peribadi atau kerja. Huraikan bagaimana komunikasi sebegini boleh disampaikan dengan berkesan dan cekap di dalam amalan sebenar.*

[15 marks/markah]

**PART B/BAHAGIAN B [25 marks/markah]****Compulsory to answer all questions.*****Wajib menjawab semua soalan.***

1. You are requested by VirTuoso Engineering Company (VT) to assess a project investment in the production of a device that can detect vitamin and mineral contents in food, named as Foodie. This project has a four-year duration. VT is also considering to invest in new machines to ensure its Foodie project has an added value in terms of innovation. You have obtained the following information on the project.

*Anda telah diminta oleh Syarikat Kejuruteraan VirTuoso (VT) untuk menilai sebuah projek pelaburan dalam pengeluaran satu peranti yang boleh mengenalpasti kandungan vitamin dan mineral dalam makanan, dinamakan sebagai Foodie. Projek ini mempunyai tempoh empat tahun. VT juga sedang mempertimbangkan untuk melabur dalam mesin-mesin baru bagi memastikan projek Foodie ini mempunyai suatu nilai tambah dari segi inovasi. Anda telah memperoleh maklumat berikut tentang projek tersebut.*

- Working capital requirement is RM 650,000 at the start of the project.  
*Keperluan modal kerja adalah RM 650,000 semasa permulaan projek.*
- Initial capital investment in machines for this project is RM 295,000.  
*Pelaburan modal awal dalam mesin-mesin untuk projek ini ialah RM 295,000.*
- Expected Foodie production (in unit), during 4-year life of the project: 16,500 (Year 1), 22,500 (Year 2), 19,500 (Year 3) and 18,500 (Year 4)  
*Jangkaan pengeluaran Foodie (dalam unit), semasa empat tahun tempoh projek: 16,500 (Tahun 1), 22,500 (Tahun 2), 19,500 (Tahun 3) and 18,500 (Tahun 4)*
- Foodie price per unit, RM 325  
*Harga seunit Foodie, RM 325*

- Variable cost per unit, RM 185  
*Kos berubah seunit, RM 185*
- Fixed cost, RM 650,000 per year  
*Kos tetap, RM 650,000 setahun*
- The RM 295,000 initial capital investment in machines is depreciated (in percentage), during 4-year life of the project: 33.33% (Year 1), 44.44% (Year 2), 14.82% (Year 3) and 7.41% (Year 4)  
*Pelaburan modal awal dalam mesin-mesin sebanyak RM 295,000 disusutnilai (dalam peratusan) semasa empat tahun tempoh projek: 33.33% (Tahun 1), 44.44% (Tahun 2), 14.82% (Tahun 3) and 7.41% (Tahun 4)*
- Tax rate is 34% per year.  
*Kadar cukai ialah 34% setahun.*

Based on the above information,  
*Berdasarkan maklumat di atas,*

- [a] Calculate the yearly net income of this project.  
*Kira pendapatan bersih tahunan projek ini.*

[5 marks/markah]

- [b] Calculate the book value of machines for this project. Evaluate the machines' condition at the end of the project.  
*Kira nilai buku mesin-mesin untuk projek ini. Nilaikan keadaan mesin-mesin di akhir projek tersebut.*

[3 marks/markah]

- [c] Working capital requirement is RM650,000 at the start of the project. After that, the annual requirement of net working capital (NWC) is 20% of revenues. The balance of NWC during Year 4 is zero. Calculate the increase in net working capital for this project.

*Keperluan modal kerja ialah RM650,000 pada permulaan projek. Selepas itu, keperluan tahunan bagi modal kerja bersih (MKB) adalah 20% dari hasil. Baki MKB semasa Tahun 4 adalah kosong. Kira kenaikan dalam modal kerja bersih bagi projek ini.*

[5 marks/markah]

- [d] Calculate total cash flow for this project if the machines have salvage value of 20% of the total cost and tax rate is 34%.

*Kira jumlah aliran tunai bagi projek ini jika mesin-mesin mempunyai nilai sisa sebanyak 20% dari jumlah kos dan kadar cukai adalah 34%.*

[5 marks/markah]

- [e] Evaluate this project based on a Net Present Value method if the required rate of return on investment is 20%. Present value factor is given in the table below:

*Nilaikan projek ini berdasarkan kaedah Nilai Kini Bersih (NKB) jika pulangan atas pelaburan yang diperlukan ialah 20%. Faktor nilai kini diberikan dalam jadual di bawah:*

[3 marks/markah]

	<b>Year 0</b> <i>Tahun 0</i>	<b>Year 1</b> <i>Tahun 1</i>	<b>Year 2</b> <i>Tahun 2</i>	<b>Year 3</b> <i>Tahun 3</i>	<b>Year 4</b> <i>Tahun 4</i>
Present Value Factor (20%) <i>Faktor Nilai Kini</i> (20%)	1.000	0.833	0.694	0.579	0.482

[f] In capital budgeting analysis, the future cash flows of a project and its costs determine an investment decision. Support this statement by giving relevant justifications.

*Dalam analisis belanjawan modal, aliran tunai masa hadapan sesebuah projek dan kos-kosnya menentukan sesuatu keputusan pelaburan. Sokong kenyataan ini dengan memberi justifikasi-justifikasi yang relevan.*

[4 marks/markah]

**PART C/BAHAGIAN C [25 marks/markah]****Answer all SIXTEEN (16) questions.*****Jawab semua ENAM BELAS (16) soalan.*****History**

1. Which of the following terms correctly states the definition of engineering according to the (American) Accreditation Board for Engineering and Technology or ABET.

*Ungkapan manakah daripada yang berikut yang menyatakan maksud 'kejuruteraan' menurut Lembaga Akreditasi Kejuruteraan dan Teknologi (Amerika Syarikat).*

- [a] The art or science of making practical application of the knowledge of pure sciences, as physics or chemistry, as in the construction of engines, bridges, buildings, mines, ships, and chemical plants. It is also the branch of profession that encompasses the generation and application of heat and mechanical power and the design, production, and use of machines and tools.

*Amalan menggunakan seni atau sains daripada ilmu sains tulen, fizik, atau kimia seperti dalam pembinaan enjin, jambatan, bangunan, lombong, kapal, dan kilang kimia. Ianya juga bidang kerjaya yang merangkumi penjanaan dan penggunaan kuasa haba dan mekanikal, dan juga rekabentuk, pengeluaran, dan penggunaan mesin dan peralatan.*

- [b] The creative application of scientific principles to design or develop structures, machines, apparatus, or manufacturing processes, or works utilizing them singly or in combination. The creative application of scientific principles to construct or operate the same (items mentioned in the above sentence) with full cognizance of their design. The creative application of scientific principles to forecast their (items mentioned in the above sentence) behavior under specific operating conditions.

*Penggunaan prinsip-prinsip saintifik dalam merkabentuk atau membangunkan struktur, mesin, peralatan, atau proses pembuatan, atau kerja melibatkan mana-mana perkara di atas secara sendiri atau gabungan. Penggunaan kreatif prinsip-prinsip saintifik dalam pembinaan dan operasi perkara-perkara yang sama seperti di atas (perkara-perkara yang disebut hayat di atas) secara sedar akan rekabentuknya. Penggunaan kreatif prinsip-prinsip saintifik dalam meramal tindak balas perkara-perkara yang sama seperti di atas (perkara-perkara yang disebut diayat di atas) di bawah keadaan-keadaan operasi tertentu.*

- [c] The application of science and mathematics by which the properties of matter and the sources of energy in nature are made useful to people. It is also, a professional discipline that involves the application of principles of physics for analysis, design, manufacturing, and maintenance of systems.

*Penggunaan ilmu matematik dan sains dimana sifat-sifat bahan dan bekalan kuasa diambil manfaatnya bagi kemudahan manusia sejagat. Ianya juga suatu bidang kerjaya melibatkan penggunaan prinsip-prinsip fizik dalam menganalisa, merkabentuk, membuat, dan menyelenggara sistem-sistem.*

- [d] The work of designing and creating large structures (such as roads and bridges) or new products or systems by using scientific methods. It is also, the branch of profession concerned with the design, manufacture, installation, and operation of engines, machines, and manufacturing processes essential to an industrial economy.

*Suatu kerjaya melibatkan rekabentuk dan pembinaan objek besar, atau produk atau sistem baru menggunakan kaedah saintifik. Ianya juga suatu cabang kerjaya berkaitan dengan rekabentuk, membuat, memasang, dan mengoperasi enjin, mesin, dan proses pembuatan yang diperlukan oleh suatu ekonomi perindustrian.*



- [e] The profession in which a knowledge of the mathematical and natural sciences gained by study, experience, and practice, is applied with judgment to develop ways to utilize, economically, the materials and forces of nature for the benefit of mankind.

*Suatu kerjaya melibatkan penggunaan ilmu matematik dan sains yang didapati secara kajian, pengalaman, dan praktis, dan digunakan secara berhemah bagi membangunkan kaedah dalam menggunakan bahan-bahan dan kuasa-kuasa yang ada bagi manfaat manusia sejagat.*

## **Ethics**

2. Which of the following statements does not say properly of the expected character of a professional engineer?

*Kenyataan manakah daripada yang berikut ini yang tidak menyebut tentang perilaku wajar bagi seorang jurutera profesional?*

- [a] Possesses education, knowledge, and skills in an engineering specialty.  
*Mempunyai pendidikan, ilmu, dan kebolehan dalam bidang kejuruteraan.*
- [b] Stays abreast of discoveries and technological changes by participation in conferences, seminars, and meetings.  
*Sentiasa mendapat maklum tentang perkembangan terkini teknologi bidangnya melalui persidangan, seminar, dan perjumpaan.*
- [c] Ensures professional source of income and honor of the society by not revealing trade secrets.  
*Memastikan pendapatannya lumayan dengan cara menyimpan rahsia perniagaan.*

[d] Guards his honor and ideals by following the codes of ethics.  
*Menjaga kehormatan dan kemuliaan kerjayanya dengan sentiasa berpegang teguh kepada kod etika.*

[e] Puts people safety first before profit in each of his professional undertaking.  
*Mengutamakan keselamatan lebih dari keuntungan dalam setiap tindakannya.*

3. The economic achievement of a country seems to go hand in hand with its technological advances – but not always necessary that way. Which of the following lists of countries has the highest overall per capita GNP?

*Pencapaian ekonomi sesebuah negara kelihatan seperti selari dengan kemajuan teknologi – tetapi tidak semestinya demikian. Yang mana diantara senarai berikut mengandungi negara-negara berperkapita tertinggi?*

- [a] Singapore, Sweden, Netherlands, Austria, Finland, Canada, Germany
- [b] New Zealand, Belgium, UAE, Japan, UK, France, Israel
- [c] Korea, Italy, Spain, Saudi Arabia, Portugal, Greece, Czech Republic
- [d] Malaysia, Hungary, Russia, Turkey, Brazil, Mexico, China
- [e] Switzerland, Ireland, Norway, Qatar, USA, Denmark, Australia

### **Environment**

4. Which of the following statements is part of the mission of United Nation Environment Program (UNEP)?

*Kenyataan yang mana satukah telah menjadi sebahagian daripada misi Program Perlindungan Alam Sekitar Bangsa-Bangsa Bersatu (UNEP)?*

- [a] To provide shelter for natives displaced by development projects.  
*Melindungi puak-puak asli yang terpinggir kerana projek-projek pembangunan.*

- [b] To continue economic, social, and cultural progress and enhancement of the quality of life of people through environmentally sound and sustainable development.

*Memajukan lagi perkembangan ekonomi, sosial, dan kebudayaan serta meningkatkan lagi kualiti hidup dikalangan penduduk melalui pembangunan persekitaran yang baik dan lestari.*

- [c] To provide leadership and to encourage partnership in caring for the environment by inspiring, informing, and enabling nations and people to improve their quality of life without compromising that of future generations.

*Memimpin untuk bekerjasama dalam penjagaan alam sekitar melalui penyebaran maklumat kepada negara-negara dunia serta penduduknya supaya mencapai mutu kehidupan yang lebih baik tanpa membebankan generasi akan datang.*

- [d] To promote, enhance, and sustain sound environmental management procedure in the process of nation building.

*Mengalakkan, meningkatkan, dan mengekalkan pengurusan alam sekitar yang baik dalam proses pembinaan negara.*

- [e] To provide a trustworthy, objective, and scientifically up-to-date explanation of scientific issues of concern to the public at large.

*Membekalkan maklumat yang boleh dipercayai, berobjektif, dan terkini tentang perkara-perkara melibatkan kemashlahatan orang ramai.*

## History

5. Which of the following lists of Malaysian engineering achievements has the correct chronological order – earliest mentioned first?

*Yang mana di antara senarai berikut yang menyusun dengan tertib pencapaian kejuruteraan di Malaysia – yang awal didahulukan?*

- [a] Petronas Twin Towers, KLIA, MEASAT1, Proton car production, First Penang Bridge, KL Tower, Second Penang Bridge, Double Track Railway
- [b] KL Tower, First Penang Bridge, Petronas Twin Towers, KLIA, MEASAT1, Proton car production, Second Penang Bridge, Double Track Railway
- [c] MEASAT1, K L Tower, Proton car production, First Penang Bridge, KLIA, Petronas Twin Towers, Second Penang Bridge, Double Track Railway
- [d] Proton car production, First Penang Bridge, KL Tower, MEASAT1, KLIA, Petronas Twin Towers, Second Penang Bridge, Double Track Railway
- [e] First Penang Bridge, Proton car production, MEASAT1, Petronas Twin Towers, KLIA, KL Tower, Second Penang Bridge, Double Track Railway

### **Ethics**

6. Which of the following statements does not say correctly of the content of Code of Ethics of Malaysian engineers?

*Yang mana diantara kenyataan berikut tidak menyebut dengan tepat tentang kandungan Kod Etika jurutera Malaysia?*

- [a] Every registered Engineer shall at all times uphold the dignity, high standing and reputation of his profession.  
*Setiap jurutera berdaftar hendaklah pada setiap waktu memastikan kehormatan, kedudukan, dan nama baik kerjayanya terpelihara.*
- [b] A registered Engineer in his responsibility to his employer, client or the profession, shall have full regard to the public interest.  
*Jurutera berdaftar, dalam melunaskan tanggungjawab kepada majikannya, pelanggannya, atau bidang kerjayanya hendaklah mengutamakan kepentingan orang awam.*

- [c] Every professional engineer shall strive to bring his name or name of his organization to fame or great reputation by taking part in professional competitions in design and innovation.  
*Setiap jurutera hendaklah berusaha supaya dirinya atau syarikatnya menjadi terkenal dengan sentiasa mengambil bahagian dalam setiap pertandingan rekabentuk dan inovasi.*
- [d] A Professional Engineer shall approve and sign only those engineering documents that he has prepared or are prepared under his direct supervision.  
*Jurutera profesional hanya mengesahkan atau menandatangani dokumen yang dia sendiri sediakan atau yang disediakan dibawah seliaannya.*
- [e] Except with the permission of his employer, a registered Engineer shall not accept any remuneration for services rendered other than from his employer  
*Kecuali dengan izin majikannya, jurutera berdaftar tidak boleh menerima apa-apa bayaran selain daripada majikannya.*

## Development

7. In which range of years is the Eleventh Malaysian Plan carried out?  
*Pada tahun berapakah Rancangan Malaysia Ke Sebelas berlangsung?*
- [a] 2006-2010  
[b] 2011-2015  
[c] 2016-2020  
[d] 1996-2000  
[e] 2001-1995

## Environment

8. What are the vision and mission of the Department of Environment (DOE), Malaysia?  
*Apakah visi dan misi Jabatan Alam Sekitar (JAS), Malaysia?*

[a] The vision is 'Environmental Conservation of Nature' while the mission is 'To provide shelter for natives displaced by development projects'.

*Visinya 'Melindungi Alam Sekitar dan Keaslian' manakala misinya 'Melindungi puak-puak asli yang terpinggir oleh projek-projek pembangunan'.*

[b] The vision is 'Environmental Conservation which is in Balance with Economic Development' while the mission is 'To continue economic, social, and cultural progress and enhancement of the quality of life of people through environmentally sound and sustainable development'.

*Visinya 'Melindungi Alam Sekitar seiring dengan Kemajuan Ekonomi' manakala misinya 'Meningkatkan pembangunan ekonomi, sosial, dan budaya dan meningkatkan kualiti kehidupan dikalangan penduduk melalui pembangunan persekitaran yang baik.*

[c] The vision is 'Environmental Conservation for the Well-being of the People' while the mission is 'To ensure sustainable development in the process of nation building'.

*Visinya 'Melindungi Alam Sekitar demi kemaslahatan penduduk' manakala misinya 'Memastikan pembangunan mampan dalam pembangunan negara'.*

[d] The vision is 'Fair Environmental Partnership between Present and Future Generation' while the mission is 'To provide leadership and to encourage partnership in caring for the environment by inspiring, informing, and enabling the nation and people to improve their quality of life without compromising that of future generations'.

*Visinya 'Perkongsian Perlindungan Alam Sekitar oleh generasi sekarang dan akan datang' manakala misinya 'membekalkan kepimpinan dan menggalakkan perkongsian dalam kerja-kerja pemeliharaan alam sekitar dengan menyemarakkan, memaklumkan dan menyokong tentang mutu hidup yang boleh ditingkatkan tanpa meminggirkan kepentingan generasi akan datang'.*

- [e] The vision is 'Rational Nation Building' while the mission is 'To promote, enhance, and sustain sound environmental management procedure in the process of nation building'.

*Visinya 'Pembangunan Negara secara berhemah' manakala misinya 'Menyokong, memantapkan, dan mengekalkan kaedah pengurusan alam sekitar berwibawa dalam proses pembangunan negara'.*

## History

9. Which of the following occurrence was not considered as part of causes that brought down the Roman civilization?

*Diantara yang berikut, yang manakah bukan penyebab runtuhnya tamadun Rom?*

- [a] Moral decay in life and rise in government corruption.

*Keruntuhan akhlak dan korupsi kerajaan.*

- [b] Decline in patriotism, military recruitment among foreigners, and invasion by the barbarian tribes.

*Kemerosotan patriotism (semangat kenegaraan), pengambilan orang luar sebagai anggota tentera, dan serangan puak-puak liar.*

- [c] The oversized empire led to costly government and military spending, which in turn led to administrative and logistical nightmare.

*Empayar yang terlalu besar telah memerlukan kos pengendalian yang sangat tinggi, dan membawa kepada kesulitan pentadbiran dan logistik.*

- [d] Roman Empire became too small as a country.  
*Empayar Rom menjadi sangat kecil untuk berfungsi sebagai sebuah negara.*
- [e] Economic troubles and overreliance on foreign slave labor.  
*Masalah ekonomi dan kebergantungan kepada tenaga buruh asing.*

### **Ethics**

10. Which of the following requirements is not part of prerequisite of a professional engineer seeking extension to his qualification for the following year?  
*Manakah diantara kenyataan berikut ini bukannya syarat bagi seseorang jurutera membolehkan dia memperbaharui kelayakan profesionalnya?*
- [a] To have attended or given professional courses recognized by the Institution of Engineers or Board of Engineers.  
*Telah menghadiri atau memberi kursus-kursus yang diiktiraf oleh Institusi Jurutera Malaysia.*
- [b] To have practiced engineering for the year either in design, supervision, management, teaching, and research.  
*Telah mengamalkan praktis kejuruteraan sama ada melalui rekabentuk, penyeliaan, pengurusan, pengajaran, atau penyelidikan.*
- [c] To have paid or to pay professional fee for the year he or she is seeking extension in.  
*Telah membayar yuran bagi tahun permohonannya.*
- [d] To have been a paying member of the Institution of Engineers, Malaysia.  
*Menjadi ahli berbayar Institusi Jurutera Malaysia.*
- [e] To have served in engineering organizational/societal activities.  
*Telah berkhidmat dalam mana-mana pertubuhan kejuruteraan atau mengambil bahagian dalam mana-mana aktiviti sosial.*



**Development**

11. What are the approximate rates of poverty in Malaysia in 1970, 1990, and 2014?

*Berapakah kadar kemiskinan di Malaysia pada tahun 1970, 1990, dan 2014?*

- [a] 75% of household, 34% of household, and 10% of household  
*75% penduduk, 34% penduduk, dan 10% penduduk*
- [b] 50% of household, 17% of household, and 0.6% of household  
*50% penduduk, 17% penduduk, dan 0.6% penduduk*
- [c] 25% of household, 12% of household, and 6% of household  
*25% penduduk, 12% penduduk, dan 6% penduduk*
- [d] 5% of household, 10% of household, and 20% of household  
*5% penduduk, 10% penduduk, dan 20% penduduk*
- [e] 50% of household, 17% of household, and 20% of household  
*50% penduduk, 17% penduduk, dan 20% penduduk*

**Environment**

12. What are the most pressing environmental concerns faced by the world today?

*Apakah masalah-masalah persekitaran yang paling mencabar yang menjadi perhatian dunia sekarang?*

- [a] Climate change, pollution, deforestation, water scarcity, loss of biodiversity, soil erosion and soil degradation  
*Perubahan iklim, pencemaran, kekurangan air, kehilangan kepelbagaian bio, hakisan tanah dan kehilangan tanah kerana hakisan.*

- [b] Poverty, over population, malnutrition, stillbirth, maternal death, and suicides rate.  
*Kemiskinan, kesesakan penduduk, kekurangan makanan, kematian kelahiran, kematian ibu sewaktu melahirkan, dan bunuh diri.*
- [c] Obesity, tobacco, drug abuse, nutrition and exercise, mental health, and immunization.  
*Kegemukan, tembakau, salahguna dadah, pemakanan dan riadah, kesihatan mental, dan imunisasi.*
- [d] Roads and transportation, job opportunity, equality between men and women, political freedoms, and quality education.  
*Jalanraya dan pengangkutan, peluang pekerjaan, jurang perbezaan lelaki perempuan, kebebasan politik, dan mutu pendidikan.*
- [e] Racial inequality, gender inequality, income inequality, wealth inequality, education inequality, employment inequality.  
*Jurang perkauman, jurang jantina, jurang pendapatan, jurang kekayaan, jurang pendidikan, jurang pekerjaan.*

## History

13. Who invented the typewriter, electric light bulb, wireless communication, and telephone communication?  
*Siapakah pencipta mesin taip, lampu elektrik, perhubungan tanpa wayar, dan perhubungan telefon?*

[a] The Americans  
*Orang Amerika*

[b] The Europeans  
*Orang Eropah*

- [c] The Asians  
*Orang Asia*
- [d] The Australians  
*Orang Australia*
- [e] All of the above  
*Semua di atas*

### **Ethics**

14. Which of the following conducts is considered inappropriate and would invite the attention of the Board of Engineers, Malaysia?

*Diantara yang berikut, yang manakah melibatkan perlakuan tidak berperaturan dan boleh mengundang teguran pihak Lembaga Jurutera Malaysia?*

- [a] This person's name is Kia Peng but he wrote it as Kia P Eng in his letter to increase the chance that the receiver would think he was a professional engineer.

*Seseorang bernama Kia Peng tetapi menulisnya sebagai Kia P Eng bagi meningkatkan peluangnya apabila penerima suratnya menyangka dia jurutera profesional.*

- [b] This person's name is Mike Shoppe but he wrote it as Mike Shop PE in his letter so the one who received it would probably think he was a professional engineer.

*Seseorang bernama Mike Shoppe tetapi menulisnya sebagai Mike Shop PE bagi meningkatkan peluangnya apabila orang menyangka dia jurutera profesional.*

- [c] This person's name is Irwan but he wrote it as Ir Wan in his letter so the one who he was writing to would hopefully think he was a professional engineer.  
*Seseorang bernama Irwan tetapi menulisnya sebagai Ir Wan dan berharap ada orang menyangka dia jurutera professional.*
- [d] This person's name is John Arumugam and he is a qualified professional engineer. He has a big screen in front of his office that says 'Ir John Arumugam, P E' to advertise his service.  
*John Arumugam jurutera bertauliah. Dia menulis namanya sebagai 'Ir John Arumugam, P E' pada suatu papan besar untuk mengiklankan perkhidmatannya.*
- [e] All of the above conducts are considered inappropriate that would invite the attention of the Board of Engineers, Malaysia.  
*Kesemua perlakuan di atas boleh dianggap melanggar peraturan dan boleh mengundang teguran pihak Lembaga Jurutera Malaysia.*

## Development

15. Over the past 40 years, how did our country change economically?  
*Dalam 40 tahun kebelakangan, bagaimanakah ekonomi negara kita telah berubah?*
- [a] The agricultural based economy has been gradually replaced by the manufacturing and knowledge based economy.  
*Ekonomi berteraskan pertanian telah diambalalih oleh ekonomi berteraskan pembuatan dan ilmu pengetahuan.*
- [b] The illiteracy rate has decreased while the average income level has increased.  
*Kadar buta huruf telah menurun manakala kadar pendapatan telah meningkat.*

- [c] Life expectancy has increased for the male and female categories.  
*Jangka hayat telah meningkat bagi kategori lelaki dan perempuan.*
- [d] The size of the middle class population has increased tremendously.  
*Kumpulan penduduk kelas pertengahan telah meningkat dengan banyaknya.*
- [c] All of the above descriptions are true.  
*Semua kenyataan di atas benar.*

### Environment

16. Which of the following statements describes the meaning of sustainability in development?

*Yang mana daripada kenyataan berikut menerangkan tentang maksud pembangunan lestari?*

- [a] Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.  
*Pembangunan yang memenuhi keperluan kini tanpa mengurangkan keupayaan generasi akan datang dalam mencari keperluan mereka.*
- [b] The overriding priority of needs, particularly the essential needs, are given to the world's poor.  
*Keutamaan yang paling didahulukan adalah dalam memenuhi keperluan penduduk termiskin dunia.*
- [c] The limitations in technological undertakings are based on environment's capacity to absorb the consequences.  
*Kekangan kepada tindakan teknologi bergantung kepada keupayaan alam sekitar dalam menyerap mana-mana akibat buruk yang terhasil.*

- [d] An approach to development that looks to balanced needs, against an awareness of the environmental, social and economic limitations of the society, although the needs can be competing against each other.

*Suatu kaedah pembangunan yang mengambil kira keperluan yang berbeza-beza, yang sedar tentang akibat kepada alam sekitar, dan kekangan sosial dan ekonomi, walau pun keperluan-keperluan ini berlawanan antara satu dengan lain.*

- [e] All of the above statements describe in parts the meaning of sustainability in development.

*Semua kenyataan di atas menerangkan sebahagian daripada maksud kelestarian dalam pembangunan.*

**PART D/ BAHAGIAN D****Answer all question/Jawab semua soalan**

4. [a] [i] Define the purpose of the Environmental Quality Act 1974 (Act 127).  
*Berikan definisi tujuan Akta Kualiti Alam Sekitar 1974 (Akta 127).*

[1 mark/markah]

- [ii] The “Arrangement of Sections” in the EQA 1974 (Act 127) has six PARTS which specifies on different aspects of the law related to the environment and the administration. Referring to PART II: Administration, explain FOUR (4) functions of the Director General and other officers of the Department of Environment Malaysia (DOE).

*“Susunan Seksyen-Seksyen” dalam Akta Kualiti Alam Sekitar 1974 (Akta 127) mempunyai enam BAHAGIAN yang memberi spesifikasi terhadap pelbagai aspek perundangan berhubungkait dengan alam sekitar dan pentadbiran. Merujuk kepada BAHAGIAN II: Pentadbiran, jelaskan EMPAT (4) fungsi Ketua Pengarah dan pegawai-pegawai di Jabatan Alam Sekitar (JAS).*

[4 marks/markah]

- [iii] En. Hanif is the head of the Environmental, Health and Safety (EHS) department for a multi national company in the free industrial zone (FIZ) in Penang. His responsibilities are monitoring the disposal of chemical waste and the performance of the wastewater treatment plant among others. During an environmental audit conducted by the management, they discovered a few employees were illegally disposing the chemical waste by dumping it in the river flowing behind the company’s building without En. Hanif’s knowledge.

Based on the incident above, describe **TWO (2)** types of possible pollutions occurring and the related regulations in the EQA 1974. Explain **THREE (3)** mitigation measures En. Hanif should take before his company is prosecuted for polluting the environment.

*En. Hanif ialah ketua jabatan alam sekitar, kesihatan dan keselamatan (EHS) di sebuah syarikat antarabangsa di zon industri bebas di Pulau Pinang. Dia bertanggungjawab memantau pembuangan sisa kimia dan prestasi pusat rawatan air sisa. Semasa satu audit alam sekitar oleh pihak pengurusan, mereka mendapati bahawa terdapat beberapa pekerja yang menyalahi undang-undang dengan membuang sisa kimia ke dalam air sungai yang mengalir di belakang bangunan syarikat tanpa pengetahuan En. Hanif.*

*Berdasarkan keadaan di atas, jelas **DUA (2)** jenis pencemaran yang berlaku dan hubungkait dengan undang-undang yang tertakluk dalam EQA 1974. Terangkan **TIGA (3)** langkah-langkah kawalan yang perlu En. Hanif jalankan sebelum syarikat beliau didakwa mencemarkan alam sekitar.*

[5 marks/markah]

- [b] Mr. Leong is a project manager of a construction company Sukses Maju Sdn. Bhd. and responsible over 43 employees working under him on a project development site at Horizon City, Penang. At the current stage of the project, most of the daily construction activities carried out on site are land clearing, excavation and filling of earth and etc.

*En. Leong ialah pengurus projek bagi syarikat pembinaan Sukses Maju Sdn. Bhd. dan bertanggungjawab ke atas 43 pekerja di sebuah kawasan projek pembangunan di Horizon City, Pulau Pinang. Pada tahap terkini projek tersebut, kebanyakan aktiviti pembinaan yang dijalankan di lokasi projek adalah pembersihan kawasan, gali dan tambun tanah dan sebagainya.*

...25/-



- [i] In order to ensure the safety, health and welfare of his employees, explain **THREE (3)** of Mr. Leong's responsibilities as an employer as regulated under PART IV: General Duties of Employers and Self Employed Persons.

*Untuk memastikan keselamatan, kesihatan dan kebajikan para pekerja, jelaskan **TIGA (3)** tanggungjawab En. Leong sebagai majikan seperti tertakluk kepada BAHAGIAN IV: Tanggungjawab Majikan dan Orang Bekerja Sendiri.*

[3 marks/markah]

- [ii] In an isolated case, one employee was operating an excavator to dig out earth on site. Discuss **THREE (3)** of the employee's responsibilities towards his workmates as regulated under PART VI: General Duties of Employees.

*Dalam kes berasingan, seorang pekerja menjalankan penggali untuk menggali keluar tanah di tapak. Bincangkan **TIGA (3)** tanggungjawab pekerja tersebut terhadap rakan-rakan sekerja seperti termaktub dalam peraturan BAHAGIAN VI: Tanggungjawab Pekerja.*

[3 marks/markah]

- [iii] Explain **THREE (3)** duties of a Safety and Health Officer on a construction site.

*Jelaskan **TIGA (3)** tanggungjawab Pegawai Keselamatan dan Kesihatan Pekerjaan di tapak pembinaan.*

[3 marks/markah]

- [c] In manufacturing industries, occupations such as the electrical charginan is consistently ranked as one of the most hazardous jobs exposed to danger. Among their tasks are as follows:

*Dalam industri pembuatan, pekerjaan seperti penjaga jentera elektrik sentiasa diletakkan di peringkat pekerjaan paling berbahaya dan terdedah kepada bahaya.*

*Antara tugas-tugas mereka adalah seperti berikut:*

- a. To carry out the installation, maintenance, testing, repair and operation of the building electrical system (normally up to 415V medium voltage).

*Menjalankan insulasi, penyelenggaraan, pemeriksaan, pembaikan dan operasi sistem elektrik dalam bangunan (lazimnya sehingga 415 V voltaj sederhana).*

- b. To maintain generator set, switch gear, capacitors, cables, wiring and electrical system incorporated with the fire protection system, air-conditioning, pump, earthing and other types of wiring within the building.

*Menyelenggara set janakuasa, suis agihan, kapasitor, kabel, pendawaian, pbumian dan pendawaian jenis lain dalam bangunan.*

- c. To carry out frequent maintenance, repair and periodic testing of all types of lighting installation.

*Menjalankan penyelenggaraan secara kerap, membaiki dan memeriksa secara berkala semua jenis pemasangan lampu.*

- [i] Explain **THREE (3)** electrical hazards involved with the work activities above.

*Jelaskan **TIGA (3)** bahaya elektrik yang berhubungkait dengan aktiviti-aktiviti kerja di atas.*

[3 marks/markah]

- [ii] Discuss **THREE (3)** safety precautions required to take when working with electricity.

*Bincangkan **TIGA (3)** langkah-langkah keselamatan yang perlu diambil ketika bekerja dengan elektrik.*

[3 marks/markah]