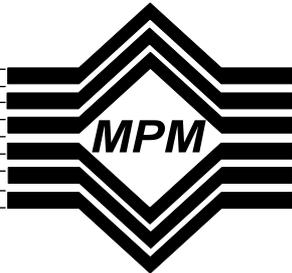


STPM/S(E)958

MAJLIS PEPERIKSAAN MALAYSIA
(MALAYSIAN EXAMINATIONS COUNCIL)



PEPERIKSAAN
SIJIL TINGGI PERSEKOLAHAN MALAYSIA
(MALAYSIA HIGHER SCHOOL CERTIFICATE EXAMINATION)

INFORMATION AND
COMMUNICATIONS TECHNOLOGY
(ICT)
Syllabus and Specimen Papers

This syllabus applies for the 2012/2013 session and thereafter until further notice.

NATIONAL EDUCATION PHILOSOPHY

“Education in Malaysia is an on-going effort towards further developing the potential of individuals in a holistic and integrated manner, so as to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonious, based on a belief in and devotion to God. Such effort is designed to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards, and who are responsible and capable of achieving a high level of personal well-being as well as being able to contribute to the betterment of the family, the society and the nation at large.”

FOREWORD

This revised Information and Communication Technology (ICT) syllabus is designed to replace the existing syllabus which has been in use since the 2002 STPM examination. This new syllabus will be enforced in 2012 and the first examination will also be held the same year. The revision of the syllabus takes into account the changes made by the Malaysian Examinations Council (MEC) to the existing STPM examination. Through the new system, the form six study will be divided into three terms, and candidates will sit for an examination at the end of each term. The new syllabus fulfils the requirements of this new system. The main objective of introducing the new examination system is to enhance the teaching and learning orientation of form six so as to be in line with the orientation of teaching and learning in colleges and universities.

The revision of the ICT syllabus aims to equip candidates' with knowledge of ICT and skills in programming and development of information systems and multimedia applications, in order to prepare them for further studies in institutions of higher learning and careers related to ICT. The delivery approach of the syllabus adopted in classroom and coursework emphasizes on systematic thinking, problem solving and other related soft skills. More practical works are given to enable candidates in mastering the concepts and skills effectively and become competent, creative and critical user of ICT. The content, delivery and assessment of ICT are designed to conform to the tri-terms system of form six.

The syllabus contains topics, teaching periods, learning outcomes, examination format, grade description and specimen papers.

The design of this syllabus was undertaken by a committee chaired by Professor Dr. Tengku Mohd bin Tengku Sembok from Universiti Kebangsaan Malaysia. Other committee members consist of university lecturers, representatives from the Curriculum Development Division, Ministry of Education Malaysia and experienced teachers who are teaching ICT. On behalf of MEC, I would like to thank the committee for their commitment and invaluable contribution. It is hoped that this syllabus will be a guide for teachers and candidates in the teaching and learning process.

Chief Executive
Malaysian Examinations Council

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SYLLABUS
958 INFORMATION AND COMMUNICATIONS TECHNOLOGY*

Aims

The ICT syllabus aims to equip candidates' with knowledge of ICT and skills in programming and development of information systems and multimedia applications, in order to prepare them for further studies in institutions of higher learning and careers related to ICT.

Objectives

The objectives of this syllabus are to enable candidates to:

- (a) describe and explain the underlying concepts of ICT and their impact in everyday life;
- (b) design and develop multimedia applications according to the development methodology;
- (c) construct algorithms and acquire skills in programming to solve problems using computers;
- (d) describe and apply systems development life cycle (SDLC) and database design techniques in information systems development.

* The Information and Communications Technology (ICT) subject could only be taken by candidates from the government or private schools which have been given permission by the Malaysian Examinations Council to offer this subject.

FIRST TERM: INTRODUCTION TO INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) AND MULTIMEDIA

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
1 ICT and Multimedia Fundamentals	20	3	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) distinguish between data, information and knowledge; (b) define ICT and multimedia; (c) explain the hardware aspect of computing technology: central processing unit (CPU), storage, input and output; (d) explain the software aspect of computing technology: system software and application software; (e) explain the communication technology: computer network, wired and wireless communication media and communication protocols; (f) explain the information (content) types: text, audio, images, animation and video; (g) explain the software development tools: programming languages, mark-up and scripting languages and authoring tools; (h) explain the Internet and World Wide Web; (i) describe the evolution of ICT convergence: information (content), computer and communication.
2 ICT and Multimedia Applications and Governance	16		<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) describe the application and impact of ICT and multimedia as an enabler in agriculture, manufacturing, e-government, Internet banking and e-commerce that contribute towards the socio-economic development; (b) describe ICT and multimedia as an industry that contributes towards business opportunity and job creation;

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
3 Multimedia Design	12		<p>(c) describe the purpose of acts that govern the usage of ICT and multimedia in Malaysia: Communication and Multimedia Act 1998, Computer Crimes Act 1997, Telemedicine Act 1997 and Digital Signature Act 1997;</p> <p>(d) discuss the ethical and social issues in cyberspace of ICT and multimedia: privacy, obscenity, defamation, Internet and information security, Internet and computer crime;</p> <p>(e) describe the types of threat to information, computer and network security: viruses, natural disasters, cyber crime and intrusive Internet.</p> <p>Candidates should be able to:</p> <p>(a) explain the principles of design organisation: harmony, variety, balance, proportion, dominance, movement and economy;</p> <p>(b) explain the elements of two-dimensional (2D) design: line, shape, texture, value and colour;</p> <p>(c) explain the elements of three-dimensional (3D) design: line, plane, volume and mass (space), texture and colour;</p> <p>(d) explain the elements of multimedia: text (fonts and faces, computer and text and hypertext and hypermedia), images (bitmaps, raster, vector, rendering and drawing and colour), animation (principles of animation), audio (digital, musical instrument digital interface (MIDI)) and video (video standard, analogue, digital, recording and editing);</p> <p>(e) describe the features of user interface design in multimedia environment.</p>

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
4 Multimedia Delivery	4		<p>Candidates should be able to:</p> <p>(a) explain the multimedia delivery options (compact disc and www (World Wide Web)) in terms of its potential and limitation (capacity and speed);</p> <p>(b) calculate the content size of the multimedia elements on each delivery model;</p> <p>(c) describe other medium of delivery: mobile devices (phone and personal digital assistant (PDA)) and game consoles.</p>
5 Multimedia Development	8	57	<p>Candidates should be able to:</p>
5.1 Idea analysis	1	6	<p>(a) perform an analysis study with regard to the need of the given project;</p> <p>(b) estimate the overall project cost;</p> <p>(c) plan and develop a project timeline;</p> <p>(d) create content outline and prototype on paper;</p> <p>(e) analyse the content, technology and delivery medium;</p> <p>(f) write an idea analysis report.</p>
5.2 Task planning	1	6	<p>Candidates should be able to:</p> <p>(a) define project goals and skill set needs;</p> <p>(b) form a multimedia team specifying the role of each member;</p> <p>(c) identify attributes of quality multimedia production;</p> <p>(d) review content outline and prototype on paper;</p> <p>(e) write a task planning report.</p>

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
5.3 Prototype development	2	15	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) build screen mock-up; (b) design content maps and user interface; (c) develop story; (d) test prototype; (e) write a prototype development report.
5.4 Alpha development	2	15	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) detail the storyboard and flowcharts; (b) finalise story script; (c) produce graphic art, audio and video with the consideration of originality and user-friendliness; (d) test working prototype; (e) write an alpha development report.
5.5 Beta development	1	12	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) distribute to limited user testing; (b) response to bug report (modification and rectification) of the product; (c) prepare user document and packaging; (d) write a beta development report.
5.6 Delivery	1	3	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) prepare master compact disk (CD) including appropriate installers; (b) packaging and delivering; (c) write a final multimedia development report consisting of user manual and technical documentation.

SECOND TERM: PROGRAMMING

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
6 Introduction to Programming	2		Candidates should be able to: <ul style="list-style-type: none"> (a) define a computer program; (b) distinguish between five generations of programming languages: first generation (machine languages), second generation (assembly languages), third generation (high-level procedural languages), fourth generation (problem-oriented languages) and fifth generation (natural languages); (c) give examples of programming languages according to generations; (d) distinguish between language translators: assemblers, compilers and interpreters.
7 Fundamentals of C Programming Language	8	12	Candidates should be able to:
7.1 C program	2	3	<ul style="list-style-type: none"> (a) explain the C program development environment: edit, preprocess, compile, link, load and execute; (b) explain types of programming errors: runtime error, syntax error and logic error; (c) explain the structure of a C program: preprocessor directives, global declarations, main function block and other required function blocks; (d) explain and use special commands on C preprocessor directives: #include and #define; (e) explain and use C language reserved words; (f) write a simple C program.

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
7.2 Basic data types	2	3	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) identify and use types of integral data: integer, character and Boolean; (b) identify and use type of floating-point data: real; (c) identify and use types of constant data: integer constants and real constants; (d) identify and use types of derived data: array and structure; (e) declare and initialise integral, floating-point and constant data types; (f) write a C program that uses integral, floating-point and constant data types.
7.3 Expressions and operators	2	3	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) convert algebraic expressions to C expressions; (b) explain types of operators: arithmetic operators, assignment operators, unary operators, equality operators, relational operators and logical operators; (c) determine precedence of operators; (d) write a C program that uses different types of operators.
7.4 Input and output	2	3	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) explain formatting output with <code>printf</code> statement; (b) explain formatting input with <code>scanf</code> statement; (c) write a C program that uses formatted output and input statements.

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
8 Problem Solving in Programming	12		<p>Candidates should be able to:</p> <p>(a) explain the importance of the order of actions to be executed;</p> <p>(b) explain steps of problem solving in programming: program clarification, program design, program code, program test and program documentation and maintenance;</p> <p>(c) explain the meaning of an algorithm;</p> <p>(d) construct algorithms using flowcharts and pseudocodes.</p>
9 Control Structures	18	21	<p>Candidates should be able to:</p> <p>(a) explain types of control structures: sequential, selection and repetition;</p> <p>(b) use suitable algorithm representations in constructing algorithms to solve problems using control structures;</p> <p>(c) explain the general format for each control structure;</p> <p>(d) convert algorithms which use sequential control structure into C statements;</p> <p>(e) convert algorithms which use selection control structures: <code>if</code>, <code>if...else</code>, nested <code>if</code> and <code>switch...case</code> into C statements;</p> <p>(f) convert algorithms which use repetition control structures: <code>for</code>, <code>while</code> and <code>do...while</code> into C statements;</p> <p>(g) use <code>break</code> and <code>continue</code> statements to alter the flow of control;</p> <p>(h) write a C program that uses control structures.</p>
10 Functions	12	15	<p>Candidates should be able to:</p>
10.1 Types of function	4	6	<p>(a) explain the meaning and the use of a function;</p> <p>(b) explain types of functions: standard library and programmer-defined;</p>

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
10.2 Function statements	8	9	<p>(c) explain types of standard library: standard input/output library functions and math library functions;</p> <p>(d) explain the general format of a programmer-defined function;</p> <p>(e) write a C program that uses standard library functions.</p> <p>Candidates should be able to:</p> <p>(a) explain types of function statements: function prototype, function definition and function call;</p> <p>(b) explain the use of function prototype, function definition and function call;</p> <p>(c) explain the general format of function prototype, function definition and function call;</p> <p>(d) write a C program that uses function prototype, function definition and function call.</p>
11 Data Structures	8	12	Candidates should be able to:
11.1 Arrays	4	6	<p>(a) state the meaning of an array;</p> <p>(b) write an array definition statement;</p> <p>(c) initialise an array;</p> <p>(d) explain the application of an array in sorting (insertion and bubble) and searching (linear);</p> <p>(e) write a C program that performs up to two-dimensional array operations for simple statistical functions (minimum, maximum and mean);</p> <p>(f) write a C program that performs passing of a one-dimensional array to functions: call by value and call by reference.</p>

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
11.2 Structures	4	6	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) explain the meaning of a structure; (b) write a structure definition statement; (c) explain the general format of a structure; (d) distinguish between types of derived data: array and structure; (e) create and initialise a structure; (f) write a C program that uses structures.

THIRD TERM: INFORMATION SYSTEMS DEVELOPMENT AND DATABASE SYSTEMS

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
12 Information Systems Development	4		<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) state the purposes of systems analysis and design; (b) explain the differences between manual systems and computerised systems; (c) describe the duties and responsibilities of personnel in systems development information system: managers, systems analysts and programmers; (d) describe the differences between types of information systems: transaction processing systems, management information systems, decision support systems and expert systems.
13 Systems Development Life Cycle (SDLC)	20	39	<p>Candidates should be able to:</p>
13.1 Introduction to SDLC	2		<ul style="list-style-type: none"> (a) describe systems development methodologies: waterfall model, rapid application development model and spiral model; (b) describe the phases in SDLC: planning, analysis, design, implementation and maintenance with reference to waterfall model.
13.2 Planning phase	2	3	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) state the purpose of the planning phase; (b) describe and perform the activities in the planning phase: initial evaluation and feasibility study; (c) produce the deliverables of the planning phase: feasibility report, problem statement, project objective, project scope and project schedule.

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
13.3 Analysis phase	6	12	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) state the purpose of the analysis phase; (b) describe the activities in the analysis phase: determination of users' requirements and structuring of system requirements; (c) state the methods of determining users' requirements: interview, survey, observations and review of procedures and documents; (d) apply suitable methods of determining users' requirements; (e) describe structuring of system requirements: process modelling, logical modelling and conceptual data modelling; (f) use data flow diagrams to model the processes; (g) use logical model representations: decision tree and decision table; (h) use entity-relationship (E-R) diagrams to model conceptual data; (i) produce the deliverables of the analysis phase: users' requirements specifications, process model, decision tree or decision table and data model.
13.4 Design phase	4	9	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) state the purpose of the design phase; (b) describe and perform the activities in the design phase: logical data design, physical data design and program structure design; (c) produce the deliverables of the design phase: logical data design, user interfaces, form design, report design and program structures using structure charts.

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
13.5 Implementation phase	4	15	<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) state the purpose of the implementation phase; (b) describe and perform the activities in the implementation phase: coding, testing, installation, evaluation, documentation, training and support; (c) explain the types of testing: manual (inspections, walkthroughs and desk checking) and automated (syntax checking, unit testing, integration test and system test) and user acceptance testing (alpha and beta); (d) produce the deliverables of the implementation phase: test report, installed system (direct, parallel, pilot and phased) and documentation (system and user); (e) explain user training and support: (design and content) and (method and delivery).
13.6 Maintenance phase	2		<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) state the purpose of the maintenance phase; (b) describe the activities in the maintenance phase: obtaining maintenance requests, transforming requests into changes, designing changes and implementing changes.
14 Fundamental of Relational Database Systems	14		<p>Candidates should be able to:</p> <ul style="list-style-type: none"> (a) explain the importance of data as an asset to organisations such as schools and hospitals; (b) explain the types of data operation: sorting, validation and abstraction; (c) describe the characteristics of good data and information which can help users in making decisions;

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
15 Database Systems Planning, Design and Administration	16	18	<p>(d) explain the data hierarchy;</p> <p>(e) define database, database systems and database management systems (DBMS);</p> <p>(f) explain the importance of database systems in administration, business and daily life;</p> <p>(g) explain the importance of software, hardware, data, people and procedure as integrated components of a database system;</p> <p>(h) describe the functions of the DBMS components: data dictionary, data manipulation language (DML) and data description language (DDL);</p> <p>(i) describe the advantages of database systems as compared to file processing systems;</p> <p>(j) describe the representations of a relational database: table, row and column;</p> <p>(k) explain the concept of keys: primary key, foreign key and candidate key;</p> <p>(l) explain the concept of data integrity.</p> <p>Candidates should be able to:</p> <p>(a) explain data redundancy, data inconsistency, data independency and data abstraction in the context of a database design;</p> <p>(b) identify the entity set, attribute, relational set and cardinality in data modelling;</p> <p>(c) use E-R diagrams to model data;</p> <p>(d) map the E-R diagram to a relational model: one-to-one, one-to-many and many-to-many binary relationships;</p> <p>(e) explain the concepts of full functional dependency, partial functional dependency and transitive functional dependency;</p>

<i>Topic</i>	<i>Teaching Period</i>		<i>Learning Outcome</i>
	<i>Theory</i>	<i>Practical</i>	
16 Query Language	6	3	<p>(f) normalise the database scheme up to the third normal form (3NF);</p> <p>(g) explain the importance of an effective database administration;</p> <p>(h) state the duties and responsibilities of database administrators.</p> <p>Candidate should be able to:</p> <p>(a) use the structured query language (SQL) to implement basic data manipulation: adding, deleting, updating, arranging and retrieving;</p> <p>(b) use SQL to create tables and to define views.</p>

Coursework (Practical Assignments)

The objective of the coursework is to develop candidates' knowledge and skills in multimedia development, programming and information systems development.

The coursework manual can be downloaded from MEC's Portal (<http://www.mpm.edu.my>) by the subject teacher during the first term of form six. The manual contains regulations and guidelines on the conduct and assessment of coursework which needs to be implemented by the school as well as coursework assignments which need to be done by candidates in the respective terms.

The coursework comprises practical assignments which are to be solved by candidates in computer laboratories during practical periods under supervision and monitoring of the teacher. The result of the assignments should be submitted to the teacher in the respective terms to be assessed according to the regulations contained in the coursework manual.

Scheme of Assessment

<i>Term of Study</i>	<i>Paper Code and Name</i>	<i>Theme/Title</i>	<i>Type of Test</i>	<i>Mark (Weighting)</i>	<i>Duration</i>	<i>Administration</i>
First Term	958/1 Information and Communications Technology (ICT) Paper 1	Introduction to Information and Communications Technology and Multimedia	Written Test: Section A Answer all 5 questions of variable marks. Section B Answer 1 out of 2 questions. All questions are based on topics 1 to 5.	50 (20%) 35 15	1½ hours	Central assessment
Second Term	958/2 Information and Communications Technology (ICT) Paper 2	Programming	Written Test: Section A Answer all 5 questions of variable marks. Section B Answer 1 out of 2 questions. All questions are based on topics 6 to 11.	50 (20%) 35 15	1½ hours	Central assessment
Third Term	958/3 Information and Communications Technology (ICT) Paper 3	Information Systems Development and Database Systems	Written Test: Section A Answer all 5 questions of variable marks. Section B Answer 1 out of 2 questions. All questions are based on topics 12 to 16.	50 (20%) 35 15	1½ hours	Central assessment
First, Second and Third Terms	958/4 Information and Communications Technology (ICT) Paper 4	Information and Communications Technology (ICT)	Coursework: 5 assignments and 2 projects to be carried out.	250 to be scaled to 100 (40%)	Throughout the three terms	School-based assessment

Performance Descriptions

A **Grade A** candidate is likely able to:

- (a) discuss and elaborate underlying concepts of ICT and their applications and impacts in everyday life;
- (b) design and construct a complete multimedia application according to the development methodology;
- (c) construct algorithms and demonstrate skills in programming to solve problems using computers;
- (d) design and develop information systems using systems development life cycle (SDLC) and database design techniques.

A **Grade C** candidate is likely able to:

- (a) discuss some basic concepts of ICT and their applications and impacts in everyday life;
- (b) partially design and construct a multimedia application according to the development methodology;
- (c) demonstrate some skills in programming to solve problems using computers;
- (d) partially design and develop information systems using systems development life cycle (SDLC) and database design techniques.

Reference Books

Information and Communications Technology (ICT) and Multimedia

1. Williams, B.K. and Sawyer, S.C., 2011. *Using Information Technology: A Practical Introduction to Computers and Communications*. 9th edition. New York: McGraw-Hill.
2. Morley, D. and Parker, C.S., 2011. *Understanding Computers: Today and Tomorrow*. 13th edition. United States: Thomson Course Technology.
3. Vaughan, T., 2011. *Multimedia: Making It Work*. 8th edition. New York: McGraw-Hill.
4. Ocvirk, O.G., et al., 2009. *Art Fundamentals: Theory and Practice*. 11th edition. New York: McGraw-Hill.

The acts related to computer and multimedia for the *Malaysian Communications and Multimedia Commission* is available at <http://www.mcmc.gov.my>

The technopreneur information is available at <http://www.mdec.com.my>

Programming

5. Deitel, P.J. and Deitel, H.M. 2010. *C: How to Program*. 6th edition. New Jersey: Prentice-Hall.
6. Forouzan, B.A. and Gilberg, R.F., 2007. *Computer Science: A Structured Programming Using C*. 3rd edition. Canada: Thomson Learning.
7. Williams, B.K. and Sawyer, S.C., 2011. *Using Information Technology: A Practical Introduction to Computers and Communications*. 9th edition. New York: McGraw-Hill.

Information Systems Development and Database Systems

8. Marakas, G.M., 2006. *Systems Analysis & Design: An Active Approach*. 2nd edition. New York: McGraw-Hill.
9. Roth, R.M., Dennis, A. and Wixom, B.H., 2012. *Systems Analysis and Design*. 5th edition. New Jersey: John Wiley & Sons.
10. Hoffer, J.A., Ramesh, V. and Topi, H., 2011. *Modern Database Management*. 10th edition. New Jersey: Pearson Education.
11. Gillenson, M.L. et al., 2008. *Introduction to Database Management*. New Jersey: John Wiley & Sons.

SPECIMEN PAPER

958/1

STPM

INFORMATION AND COMMUNICATIONS TECHNOLOGY (TEKNOLOGI MAKLUMAT DAN KOMUNIKASI)

PAPER 1 (KERTAS 1)

One and a half hours (Satu jam setengah)

MAJLIS PEPERIKSAAN MALAYSIA
(MALAYSIAN EXAMINATIONS COUNCIL)

SIJIL TINGGI PERSEKOLAHAN MALAYSIA
(MALAYSIA HIGHER SCHOOL CERTIFICATE)

Instructions to candidates:

DOT NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO.

*Answer **all** questions in Section A.*

*Answer any **one** question in Section B.*

The intended marks for questions or parts of questions are given in brackets [].

All necessary working must be shown clearly.

Arahan kepada calon:

JANGAN BUKA KERTAS SOALAN INI SEHINGGA ANDA DIBENARKAN BERBUAT DEMIKIAN.

*Jawab **semua** soalan dalam Bahagian A.*

*Jawab mana-mana **satu** soalan dalam Bahagian B.*

Markah bagi setiap soalan atau bahagian-bahagian soalan diberikan dalam [].

Semua kerja yang perlu hendaklah ditunjukkan dengan jelas.

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STPM 958/1

Section A [35 marks]

Answer all questions in this section.

- 1** (a) Define the terms *data*, *information* and *knowledge*. [3 marks]
- 2** Most multimedia and Web-based contents are displayed as RGB in computer screen monitors.
- (a) What is RGB? [2 marks]
- (b) How many colours can an 8-bit pixel represent? [1 mark]
- (c) State the difference between a pixel and a bit. [2 marks]
- 3** Many successful multimedia contents are highly dependent on a proper planning from idea analysis to delivery stage. Describe **five** steps in the idea analysis stage. [5 marks]
- 4** The Malaysian government's official portal, www.gov.my, provides information for the needs of four categories of visitors, namely citizen, non-citizen, government servant and business man.
- (a) State **two** software needed to access the www.gov.my portal. [2 marks]
- (b) Describe, with the aid of a diagram, the connection between your computer at home or school to the server which hosts the www.gov.my portal. [4 marks]
- (c) Does the www.gov.my portal represent an e-government? State your reason. [2 marks]
- (d) State **two** impacts of e-government. [2 marks]
- 5** A multimedia company wishes to develop two different multimedia contents. The information on the multimedia content that are to be developed are as follows:
- Content A: A game design that is able to attract attention, enjoyable and challenging to users. It is suitable to be used at home. Its main targets are children and teenagers. This content will be categorised as entertainment material.
- Content B: A learning content that is able to help students to improve their knowledge and skills in science subjects. It is suitable to be used in schools and at home. Its main targets are students and teachers.
- (a) List **four** multimedia elements that are required to developed content A, and give reasons for the choice of the elements. [8 marks]
- (b) Explain **four** characteristics of content B in order to achieve its development objectives. [4 marks]

Bahagian A [35 markah]

Jawab semua soalan dalam bahagian ini.

- 1 (a) Takrifkan istilah *data*, *maklumat*, dan *pengetahuan*. [3 markah]
- 2 Kebanyakan kandungan multimedia dan kandungan berasaskan Web dipamerkan sebagai RGB pada skrin komputer.
- (a) Apakah RGB? [2 markah]
- (b) Berapakah warna yang boleh diwakili oleh 8-bit piksel? [1 markah]
- (c) Nyatakan perbezaan antara piksel dengan bit. [2 markah]
- 3 Kebanyakan kejayaan kandungan multimedia bergantung tinggi kepada perancangan yang betul dari peringkat analisis idea ke peringkat penyampaian. Perihalkan **lima** langkah yang terdapat dalam peringkat analisis idea. [5 markah]
- 4 Portal rasmi kerajaan Malaysia, www.gov.my, menyediakan maklumat untuk kegunaan empat kategori pelawat, iaitu warga negara, bukan warga negara, kakitangan kerajaan, dan ahli perniagaan.
- (a) Nyatakan **dua** perisian yang diperlukan untuk mengakses portal www.gov.my. [2 markah]
- (b) Perihalkan, dengan bantuan gambarajah, penyambungan antara komputer anda di rumah atau di sekolah dengan pelayan yang menerima portal www.gov.my. [4 markah]
- (c) Adakah portal www.gov.my mewakili e-government? Nyatakan alasan anda. [2 markah]
- (d) Nyatakan **dua** impak e-government. [2 markah]
- 5 Sebuah syarikat multimedia ingin membangunkan dua kandungan multimedia yang berlainan. Maklumat tentang kandungan multimedia yang hendak dibangunkan adalah seperti yang berikut:
- Kandungan A: Satu reka bentuk permainan yang mampu menarik perhatian, menyeronokkan dan memberi cabaran kepada pengguna. Kandungan ini sesuai digunakan di rumah. Sasaran utamanya ialah kanak-kanak dan remaja. Kandungan ini akan dikategorikan sebagai bahan hiburan.
- Kandungan B: Satu kandungan pembelajaran yang dapat membantu pelajar untuk meningkatkan pengetahuan dan kemahiran mereka dalam mata pelajaran sains. Kandungan ini sesuai digunakan di sekolah dan di rumah. Sasaran utamanya ialah pelajar dan guru.
- (a) Senaraikan **empat** elemen multimedia yang diperlukan untuk membangunkan kandungan A, dan berikan alasan bagi pemilihan elemen tersebut. [8 markah]
- (b) Jelaskan **empat** ciri kandungan B supaya dapat mencapai objektif pembangunannya. [4 markah]

Section B [15 marks]

*Answer any **one** question in this section.*

6 Availability of various communication technologies allows home users to connect personal computers (PCs) to the Internet using wired or wireless connection.

(a) Illustrate in the form of diagram how to connect three PCs in a home to the Internet using wired or wireless technology. [5 marks]

(b) Explain **three** advantages and **two** threats of having Internet access at home. [10 marks]

7 In any work of conventional or new media subject, form and content are often used to measure good or bad design. These components may vary in degree of emphasis based on the arrangement of elements and principles of design organisation.

(a) List **five** elements of two-dimensional (2D) design. [5 marks]

(b) The diagram below is a Google's™ search engine logo that is designed to portray an important event. Briefly describe the significant features of the design in the diagram based on the principles of design organisation. [10 marks]



Google™ logo (source from: <http://www.google.com/holidaylogos06.html>)

Bahagian B [15 markah]

Jawab salah satu soalan dalam bahagian ini.

6 Ketersediaan teknologi komunikasi yang pelbagai membolehkan pengguna di rumah menghubungkan komputer peribadi (PC) ke Internet menggunakan sambungan berwayar atau tanpa wayar.

(a) Ilustrasikan dalam bentuk gambar rajah bagaimana menyambungkan tiga buah PC di rumah ke Internet menggunakan teknologi berwayar atau tanpa wayar. [5 markah]

(b) Jelaskan **tiga** kelebihan dan **dua** ancaman mempunyai capaian Internet di rumah. [10 markah]

7 Dalam sebarang kerja biasa atau subjek media baharu, bentuk dan kandungan sering digunakan untuk mengukur reka bentuk yang baik atau yang buruk. Komponen tersebut boleh berubah mengikut tahap penekanan berdasarkan penyusunan elemen dan prinsip reka bentuk organisasi.

(a) Senaraikan **lima** elemen reka bentuk dua dimensi (2D). [5 markah]

(b) Gambar rajah di bawah ialah logo enjin pencarian Google's™ yang direka bentuk untuk menggambarkan kepentingan sesuatu peristiwa. Perihalkan dengan ringkas ciri penting reka bentuk dalam gambar rajah itu berdasarkan prinsip reka bentuk organisasi. [10 markah]



Google™ logo (sumber daripada: <http://www.google.com/holidaylogos06.html>)

SPECIMEN PAPER

958/2

STPM

INFORMATION AND COMMUNICATIONS TECHNOLOGY (TEKNOLOGI MAKLUMAT DAN KOMUNIKASI)

PAPER 2 (KERTAS 2)

One and a half hours (Satu jam setengah)

MAJLIS PEPERIKSAAN MALAYSIA
(MALAYSIAN EXAMINATIONS COUNCIL)

SIJIL TINGGI PERSEKOLAHAN MALAYSIA
(MALAYSIA HIGHER SCHOOL CERTIFICATE)

Instructions to candidates:

DOT NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO.

*Answer **all** questions in Section A.*

*Answer any **one** question in Section B.*

The intended marks for questions or parts of questions are given in brackets [].

All necessary working must be shown clearly.

Arahan kepada calon:

JANGAN BUKA KERTAS SOALAN INI SEHINGGA ANDA DIBENARKAN BERBUAT DEMIKIAN.

*Jawab **semua** soalan dalam Bahagian A.*

*Jawab mana-mana **satu** soalan dalam Bahagian B.*

Markah bagi setiap soalan atau bahagian-bahagian soalan diberikan dalam [].

Semua kerja yang perlu hendaklah ditunjukkan dengan jelas.

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STPM 958/1

Section A [35 marks]

Answer **all** questions in this section.

1 Describe the development of computer programming languages from the first generation to the fourth generation. [4 marks]

2 A declaration in C is given as follows.

```
int a = 5, b = 2, c = 4, d = 6, e = 5;
```

Show the operations and the result for each of the following expressions.

(a) $e \% b * c > 5 \quad || \quad c \% b * d < 7$ [3 marks]

(b) $e \% b *(c > 5) \quad || \quad c \% b *(d < 7)$ [3 marks]

3 Write a code segment in C that produces a multiplication table for a number entered by a user. An example of the display is given as follows. [6 marks]

```
Enter number: 5

Multiplication table 5

1 x 5 = 5
2 x 5 = 10
3 x 5 = 15
.
.
.
12 x 5 = 60
```

4 (a) What is the use of control structures? [2 marks]

(b) Give **three** types of control structures and state the characteristic of each control structure. [6 marks]

Bahagian A [35 markah]

Jawab semua soalan dalam bahagian ini.

1 Perihalkan perkembangan bahasa pengaturcara komputer daripada generasi pertama hingga generasi keempat. [4 markah]

2 Satu pengisytiharan dalam C diberikan seperti yang berikut.

```
int a = 5, b = 2, c = 4, d = 6, e = 5;
```

Tunjukkan operasi dan keputusan bagi setiap ungkapan yang berikut:

(a) $e \% b * c > 5 \quad || \quad c \% b * d < 7$ [3 markah]

(b) $e \% b *(c > 5) \quad || \quad c \% b *(d < 7)$ [3 markah]

3 Tulis satu segmen kod dalam C yang menghasilkan jadual pendaraban bagi satu nombor yang dimasukkan oleh seorang pengguna. Contoh paparan diberikan seperti yang berikut. [6 markah]

```
Masuk nombor: 5

Sifir darab 5

1 x 5 = 5
2 x 5 = 10
3 x 5 = 15
.
.
.
12 x 5 = 60
```

4 (a) Apakah kegunaan struktur kawalan? [2 markah]

(b) Berikan **tiga** jenis struktur kawalan dan nyatakan ciri-ciri bagi setiap struktur kawalan. [6 markah]

5 The following table shows the rates for calls and data transmission offered by the telecommunication company SyazesCom. A 15% discount is given if the total charge exceeds RM160.

<i>Item</i>	<i>Rate</i>
Peak hour call	RM0.18 per minute
Off peak hour call	RM0.12 per minute
Data transmission	RM0.015 per Mbit

(a) Write a pseudocode to calculate the telecommunication charges and print bills for SyazesCom's customers. The pseudocode should include the following.

- Read the total time in minutes for calls during peak hours;
- Read the total time in minutes for calls during off peak hours;
- Read the size of the data in Mbit that is transmitted;
- Calculate the charge for each item and the total charge;
- Calculate the actual charge after discount;
- Print the bill that includes all the items read and calculated.

[5 marks]

(b) Write `define` statements in C to declare rates for calls during peak hours and off peak hours, data transmissions and discount. [2 marks]

(c) Write declaration statements in C for variables of all items read and calculated. [2 marks]

(d) Write **two** function prototype declaration statements in C with suitable parameters to calculate total charge and actual charge. [2 marks]

5 Jadual berikut menunjukkan kadar panggilan dan penghantaran data yang ditawarkan oleh syarikat telekomunikasi SyazesCom. Diskaun sebanyak 15% diberikan jika jumlah caj melebihi RM160.

<i>Item</i>	<i>Kadar</i>
Panggilan waktu puncak	RM0.18 per minit
Panggilan bukan waktu puncak	RM0.12 per minit
Penghantaran data	RM0.015 per Mbit

(a) Tulis pseudokod untuk menghitung caj telekomunikasi dan mencetak bil bagi pelanggan SyazesCom. Pseudokod hendaklah merangkumi yang berikut.

- Baca jumlah masa dalam minit bagi panggilan semasa waktu puncak;
- Baca jumlah masa dalam minit bagi panggilan bukan semasa waktu puncak;
- Baca saiz data dalam Mbit yang dihantar;
- Hitung caj setiap item dan jumlah caj;
- Hitung caj sebenar selepas diskaun;
- Cetak bil yang merangkumi semua item yang dibaca dan dihitung.

[5 markah]

(b) Tulis kenyataan `define` dalam C untuk mengisytiharkan kadar bagi panggilan semasa waktu puncak, kadar bagi panggilan bukan semasa waktu puncak, kadar penghantaran data, dan kadar bagi diskaun.

[2 markah]

(c) Tulis kenyataan pengisytiharan dalam C untuk pembolehubah semua item yang dibaca dan dihitung.

[2 markah]

(d) Tulis **dua** fungsi kenyataan pengisytiharan prototaip dalam C dengan parameter yang sesuai untuk menghitung jumlah caj dan caj sebenar.

[2 markah]

Section B [15 marks]

Answer any one question in this section.

6 The Video Academy holds a competition to find a new talented video producers. Candidates need to prepare video clips according to the theme given each week. The video clips are judged based on SMS votes (50%) and jury's marks (50%). Each week the candidates who has the lowest score is eliminated.

The following table shows the SMS votes and jury's marks for candidates in the previous week.

<i>Candidate's ID</i>	<i>SMS votes</i>	<i>Jury's marks</i>
1001	8108	67
1005	338	63
1007	1769	55
1011	2141	88
1021	3602	58
1025	4422	72

The candidates's IDs, SMS votes and jury's marks are stored in the arrays `candidatesID`, `SMSVotes` and `juryMarks` respectively.

(a) Design an algorithm

- to calculate the percentage of SMS votes of candidates and store them in array `SMSPercent`;
- to calculate the final scores of candidates and store them in the array `finalResult`;
- to print candidates's ID and their final scores;
- to find and print the eliminated candidate's ID. [6 marks]

(b) Write a program in C for the algorithm in (a). [9 marks]

7 A bookshop manage updates information about the books in his shop. The information stored consists of the titles, quantities and prices of books. The books are arranged according titles to facilitates the calculation of the value of the asset. The value of the asset is calculated by summing the products of the quantities and the prices of books.

The constant value of `LENGHT` is the field size to store the title of book and `STOCK` is the number of different titles in the shop. The title, quantity and price of book are stored in a data structure named `struct bookStock`.

(a) Write a define statement to declare `LENGHT` which has a value of 20 and `STOCK` which has a value of 100. [1 mark]

(b) Write a `struct bookStock` statement which contains the title, quantity and price of a book. [2 marks]

(c) Write a statement to declare `book` of the type `struct bookStock`. [1 mark]

(d) Design an algorithm that reads title, quantity and price of a book. Calculate and print the total asset for all the book titles in the shop. [6 marks]

(e) Write a code statement in C for the algorithm in (d). [5 marks]

Bahagian B [15 markah]

Jawab salah satu soalan dalam bahagian ini.

6 Akademi Video mengadakan satu pertandingan untuk mencari penerbit video yang berbakat. Calon perlu menyediakan klip video berdasarkan tema yang diberikan setiap minggu. Klip video itu diadili berdasarkan undian SMS (50%) dan markah juri (50%). Setiap minggu calon yang mendapat skor terendah disingkirkan.

Jadual yang berikut menunjukkan undian SMS dan markah juri untuk calon dalam minggu sebelumnya.

<i>ID calon</i>	<i>Undian SMS</i>	<i>Markah juri</i>
1001	8108	67
1005	338	63
1007	1769	55
1011	2141	88
1021	3602	58
1025	4422	72

ID calon, undian SMS, dan markah juri masing-masing disimpan dalam tatasusunan `IDcalon`, `undianSMS`, dan `markahJuri`.

(a) Reka bentuk satu algoritma

- untuk menghitung peratusan undian SMS calon dan menyimpannya dalam tatasusunan `peratusanSMS`;
- untuk menghitung skor akhir calon dan menyimpannya dalam tatasusunan `keputusanAkhir`;
- untuk mencetak ID calon dan skor akhir mereka;
- untuk mencari dan mencetak ID calon yang disingkirkan. [6 markah]

(b) Tulis satu atur cara dalam C bagi algoritma dalam (a). [9 markah]

7 Pengurus sebuah kedai buku mengemaskinikan maklumat tentang buku yang terdapat di kedainya. Maklumat yang disimpan terdiri daripada judul, kuantiti, dan harga buku. Buku disusun mengikut judul untuk memudahkan penghitungan nilai aset. Nilai aset dihitung dengan menjumlahkan hasil darab kuantiti dan harga buku.

Satu nilai pemalar `PANJANG` ialah saiz medan untuk menyimpan judul buku dan `STOK` ialah bilangan judul yang berbeza di kedai. Judul, kuantiti, dan harga buku disimpan dalam satu struktur data yang dinamakan `struct stokBuku`.

(a) Tulis kenyataan `define` untuk mengisytiharkan `PANJANG` yang mempunyai nilai 20 dan `STOK` yang mempunyai nilai 100. [1 markah]

(b) Tulis kenyataan `struct stokBuku` yang mengandungi judul, kuantiti, dan harga buku. [2 markah]

(c) Tulis kenyataan untuk mengisytiharkan buku jenis `struct stokBuku`. [1 markah]

(d) Bina satu algoritma yang membaca judul, kuantiti, dan harga buku. Hitung dan cetak jumlah aset bagi semua judul buku di kedai. [6 markah]

(e) Tulis satu segmen kod dalam C bagi algoritma dalam (d). [5 markah]

SPECIMEN PAPER

958/3

STPM

INFORMATION AND COMMUNICATIONS TECHNOLOGY (TEKNOLOGI MAKLUMAT DAN KOMUNIKASI)

PAPER 3 (KERTAS 3)

One and a half hours (Satu jam setengah)

MAJLIS PEPERIKSAAN MALAYSIA
(MALAYSIAN EXAMINATIONS COUNCIL)

SIJIL TINGGI PERSEKOLAHAN MALAYSIA
(MALAYSIA HIGHER SCHOOL CERTIFICATE)

Instructions to candidates:

DOT NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO.

*Answer **all** questions in Section A.*

*Answer any **one** question in Section B.*

The intended marks for questions or parts of questions are given in brackets [].

All necessary working must be shown clearly.

Arahan kepada calon:

JANGAN BUKA KERTAS SOALAN INI SEHINGGA ANDA DIBENARKAN BERBUAT DEMIKIAN.

*Jawab **semua** soalan dalam Bahagian A.*

*Jawab mana-mana **satu** soalan dalam Bahagian B.*

Markah bagi setiap soalan atau bahagian-bahagian soalan diberikan dalam [].

Semua kerja yang perlu hendaklah ditunjukkan dengan jelas.

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STPM 958/3

Section A [35 marks]

Answer all questions in this section.

- 1** SMK Puteri Mas has been using manual system for student registration. The school intends to replace the existing manual system with a computerised system. Explain **five** advantages of using a computerised system. [5 marks]
- 2** Data is an important asset to an organisation.
- (a) State **two** types of data operations. [2 marks]
- (b) State **three** important characteristics of data to assist a manager in making decision. [3 marks]
- 3** In a workers' database system there exist a set of relationships between the staff entity set and the dependants entity set. The dependants entity set represents the wife or husband and children of a member of the staff.
- (a) State the meaning of a *strong entity set* and a *weak entity set*. [2 marks]
- (b) Identify the strong entity and the weak entity. [2 marks]
- (c) Draw an entity relationship (E-R) diagram for the above relationship. [3 marks]
- 4** The following table shows the Form Two students of SMK Kenanga and their respective sport houses.

STUDENT

<i>StudentNum</i>	<i>Name</i>	<i>Form</i>	<i>SportHouse</i>
2111	Suraya Ali	2A	Blue
2222	Teo Poh Thiam	2A	Red
2333	Ravi Chandran	2B	Blue
2444	Jamaliah Abu	2B	Yellow
2555	Lokman Hakim	2C	Yellow
2666	Cynthia Smith	2D	Green

Write the output for the following SQL expressions.

- (a) SELECT Name, SportHouse
FROM STUDENT
WHERE SportHouse = "Yellow"
OR SportHouse = "Blue"; [2 marks]
- (b) SELECT Name
FROM STUDENT
ORDER BY Name DESC; [3 marks]
- (c) DELETE FROM STUDENT
WHERE Form = "2B"; [3 marks]
- 5** Describe the integrated components of a database system. [10 marks]

Bahagian A [35 markah]

Jawab semua soalan dalam bahagian ini.

- 1** SMK Puteri Mas menggunakan sistem manual untuk pendaftaran pelajar. Pihak sekolah bercadang untuk menggantikan sistem manual sedia ada dengan sistem pendaftaran berkomputer. Jelaskan **lima** kebaikan menggunakan sistem pendaftaran berkomputer. [5 markah]
- 2** Data merupakan aset yang penting bagi sesebuah organisasi.
- (a) Nyatakan **dua** jenis pengendalian data. [2 markah]
- (b) Nyatakan **tiga** ciri penting data untuk membantu seseorang pengurus membuat keputusan. [3 markah]
- 3** Dalam satu sistem pangkalan data pekerja wujud satu set perhubungan antara set entiti staf dengan set entiti tanggungan. Set entiti tanggungan mewakili isteri atau suami dan anak-anak bagi ahli staf.
- (a) Nyatakan maksud *set entiti kuat* dan *set entiti lemah*. [2 markah]
- (b) Kenal pasti entiti kuat dan entiti lemah. [2 markah]
- (c) Lukis gambar rajah perhubungan entiti (E-R) bagi perhubungan di atas. [3 markah]
- 4** Jadual berikut menunjukkan pelajar tingkatan dua SMK Kenanga dan rumah sukan mereka.

PELAJAR

<i>NoPelajar</i>	<i>Nama</i>	<i>Tingkatan</i>	<i>RumahSukan</i>
2111	Suraya Ali	2A	Biru
2222	Teo Poh Thiam	2A	Merah
2333	Ravi Chandran	2B	Biru
2444	Jamaliah Abu	2B	Kuning
2555	Lokman Hakim	2C	Kuning
2666	Cynthia Smith	2D	Hijau

Tulis output bagi ungkapan SQL yang berikut.

- (a) SELECT Nama, RumahSukan
FROM PELAJAR
WHERE RumahSukan = "Kuning"
OR RumahSukan = "Biru"; [2 markah]
- (b) SELECT Nama
FROM PELAJAR
ORDER BY Nama DESC; [3 markah]
- (c) DELETE FROM PELAJAR
WHERE Tingkatan = "2B"; [3 markah]
- 5** Perihalkan komponen bersepadu bagi sebuah sistem pangkalan data. [10 markah]

Section B [15 marks]

Answer any one question in this section.

6 (a) Describe **three** deliverables of the planning phase. [6 marks]

(b) There are various types of application testing that can be performed to ensure the quality of a system. Explain the code inspection, the structured walk-through and the desk check tests. [9 marks]

7 A company which sells several types of product performs its operations based on the following business rules.

- A product is supplied by several vendors. A vendor can supply several products.
- Each type of product can be bought by many customers. Each customer can buy several types of products.
- An invoice is written by a sales representative. Each sales representative can write many invoices.
- An invoice may describe one or more type of products. Products sold may be described in different invoices.

Construct an entity relationship (E-R) diagram to represent the operations of the company as follows.

(a) Draw all the entities with their attributes, and underline the primary key attributes for each entity. [3 marks]

(b) Indicate the relationships between all the entities. [4 marks]

(c) Indicate the cardinalities of all the relationships. [4 marks]

(d) Map the entity relationship (E-R) diagram that you have produced in steps (a) through (c) into a relational schema. [4 marks]

Bahagian B [15 markah]

Jawab salah **satu** soalan dalam bahagian ini.

6 (a) Perihalkan **tiga** hasil fasa perancangan. [6 markah]

(b) Terdapat beberapa jenis aplikasi ujian yang boleh dilaksanakan untuk memastikan kualiti sesuatu sistem. Jelaskan kod pemeriksaan, *walk-through* berstruktur, dan ujian pemeriksaan meja. [9 markah]

7 Sebuah syarikat yang menjual pelbagai produk menjalankan operasinya berdasarkan peraturan perniagaan yang berikut.

- Satu produk dibekalkan oleh beberapa vendor. Satu vendor boleh membekalkan beberapa produk.
- Setiap jenis produk boleh dibeli oleh banyak pelanggan. Setiap pelanggan boleh membeli beberapa produk.
- Satu invoice ditulis oleh seorang wakil penjual. Seorang wakil penjual boleh menulis banyak invoice.
- Satu invoice boleh memerihalkan satu produk atau lebih. Produk yang dijual boleh diperihalkan dalam invoice yang berlainan.

Bina satu gambar rajah perhubungan entiti (E-R) untuk mewakili operasi syarikat itu seperti yang berikut.

(a) Lukis semua entiti berserta atributnya, dan gariskan atribut kunci primer bagi setiap entiti. [3 markah]

(b) Tunjukkan perhubungan antara semua entiti. [4 markah]

(c) Tunjukkan kekardinalan semua perhubungan. [4 markah]

(d) Petakan gambar rajah hubungan entiti (E-R) yang anda lukis dalam langkah (a) hingga langkah (c) kepada hubungan skema. [4 markah]

SPECIMEN ASSIGNMENTS

958/4

STPM

**INFORMATION AND COMMUNICATIONS TECHNOLOGY
(TEKNOLOGI MAKLUMAT DAN KOMUNIKASI)**

PAPER 4 (KERTAS 4)

**MAJLIS PEPERIKSAAN MALAYSIA
(MALAYSIAN EXAMINATIONS COUNCIL)**

**SIJIL TINGGI PERSEKOLAHAN MALAYSIA
(MALAYSIA HIGHER SCHOOL CERTIFICATE)**

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Skill A Assignment: Multimedia Development

Interactive Multimedia Presentation on “Love Thy Neighbour”

Malaysia is a multi-racial and multi-religious nation. Therefore, maintaining harmonious relationship amongst her citizens is vital for nation-building. The basis for improving ethnic relations is to create a sense of belonging and understanding amongst the citizens especially in residential areas and villages. Towards this aspiration, the concept of “Love Thy Neighbour” is mooted by the government and to be promoted to all residents.

You are required to design, develop and deliver an interactive multimedia presentation on the topic of “Love Thy Neighbour” to your neighbourhood. The specifications for the presentation would require that the presentation be non-linear, so that the presenter could have control over the presentation by having non-linear access to the contents of the presentation. It is suggested that this could be done using navigation buttons, linkages, or menu-driven interfaces. The presentation must contain at least 15 screens of multimedia information.

[90 marks]

Skill B Assignment: Programming

Functions

Travel Distance Calculator computes travelling time, petrol consumption and total petrol cost from a departure city to a destination city.

Write a function `travelDistanceCalculator` that accepts travel distance, average speed in kilometre per hour, petrol consumption in kilometre per litre, petrol cost in Ringgit Malaysia per litre and displays travel distance, travelling time, total petrol consumption and total petrol cost.

Write a program in C that reads travel distance between two cities, petrol consumption in kilometre per litre, petrol cost in Ringgit Malaysia per litre and average speed in kilometre per hour, and calls function `travelDistanceCalculator`. The user interface screen may appear as in the figure below.

You must construct a pseudocode or flowchart before writing the program.

Please enter travel distance in kilometre: 144			
Please enter average speed in kilometre per hour: 110			
Please enter petrol consumption in kilometre per litre: 16.3			
Please enter petrol cost in RM per litre: 1.92			
Travel Distance	Travelling Time	Total Petrol Consumption	Total Petrol Cost
144 km	60 min	8.83 litres	RM 16.96

[80 marks]

Skill C Assignment: Information Systems Development

PIBG Management Information System

Like any other school, Sungai Mulia Secondary School has a parent teacher association (PIBG) that helps in the running of the school activities. Students' parents are automatic members of PIBG and are eligible to stand for election as committee members. Besides parents, teachers may also be elected as committee members. The committee of PIBG intends to develop an information system to automate some aspects of management of the association. The system can produce a report containing information of the parents and their children in the school. It is capable of identifying suitable members for specific activities based on criteria such as their professions and incomes. Yearly report on members' involvements and contributions to PIBG can be generated. The system can also identify active members based on their involvements and amount of donations per year. In designing the system, the following assumptions should be taken into consideration.

- a. Each member is assigned a unique membership number. Other personal information such as member's name, date of birth, race, religion, occupation, expertise, position in PIBG committee, income, address, telephone number and spouse's name are also recorded.
- b. Each student is assigned a unique student number. Other personal information such as student's name, date of birth, class name and telephone number are also recorded.
- c. Every PIBG activity is assigned a unique activity number. Other relevant information such as description, date and budget are also recorded.
- d. Each member's involvement in the activity is recorded. Information such as member's role in the activity and the amount donated are also recorded.

[80 marks]