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 முழுப் பதிப்புரிமையடையது.]
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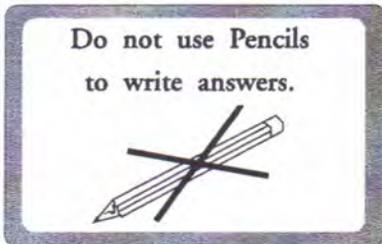
Open Competitive Examination for Recruitment to Class 2 Grade II of Sri Lanka
 Information and Communication Technology Service - 2015

(01) Information and Communication Technology

Two hours

Instructions to Candidates

Very Important :



Do not use Pencils
 to write answers.

* Answer scripts where the numbers are not written as indicated below will not be marked / evaluated.

1 2 3 4

Write your Index Number here, and
 on pages 3 and 5 in the spaces
 indicated.

.....

Checked as correct

.....

Invigilator's Initials

Important :

- * This paper consists of 65 questions on 11 pages.
- * Before answering the paper arrange all the pages in order.
- * Answer all questions on this paper itself.
- * The time allowed for this paper is two hours.
- * Commence answering only after the Centre Supervisor's announcement.
- * Instructions given should be strictly followed in answering this paper and marks will not be awarded for answers not in accordance with these instructions.
- * Even if you are not attempting the paper hand it over to the Supervisor.
- * Write the answers clearly and legibly in blue or black ink only and not in pencil.
- * It is an offence to remove this paper from the examination hall or turn out photocopies of the same.
- * Answer scripts with illegible figures, illegible handwriting, those where erasing fluid has been used and written in pencil will not be marked / evaluated.

For Examiner's use only

Page No.	Question No.	Marks Awarded
2	1 - 11	
3	12 - 18	
4	19 - 30	
5	31 - 42	
6	43 - 52	
7	53- 56	
8	57 - 58	
9	59 - 61	
10	62 - 63	
11	64 - 65	
Total		

Final Score

In figures	
In words	
Marking Examiner	
Checked by	

● For questions from No. 1 to 50, select the correct or the most appropriate answer and write the **number** of the relevant choice **on the dotted line** provided against the question.

1. Which of the following is correct with respect to L1 cache memory?
 (1) It always resides in RAM.
 (2) It always resides in CPU.
 (3) It comes in between registers and RAM.
 (4) It is an external device. (.....)

2. The memory that can be accessed by a processor having 32-bit address bus is
 (1) 2KB (2) 2GB (3) 4GB (4) 32GB (.....)

3. Communication between a computer and a keyboard involves transmission.
 (1) automatic (2) half duplex (3) full duplex (4) simplex (.....)

4. is an operating system used in mobile phones.
 (1) CentOS (2) Android (3) Fedora (4) SSP (.....)

5. Consider the following freely available office suites.

- A - Apache OpenOffice
- B - Google Docs
- C - LibreOffice

Which of the above are 'open source Software'?

- (1) A and B only (2) A and C only (3) B and C only (4) All A, B and C (.....)

6. The facility that looks for hidden contents, other information and properties that might create compatibility issues in an MS Word document is,
 (1) backstage view. (2) inspect document.
 (3) track changes. (4) check compatibility. (.....)

7. Which of the following object **can't** be inserted to a MS Word document?
 (1) bit map image (2) hyperlink (3) header (4) e-mail message (.....)

8. The facility in MS Excel to step through each part of the formula individually is called
 (1) trace precedents. (2) watch window.
 (3) error checking. (4) evaluate formula. (.....)

9. In MS Excel a field that appears on the pivot table but not a field in the source data is called,
 (1) a ghost field. (2) a calculated field.
 (3) a source field. (4) a dynamic field. (.....)

10. Consider the following expressions and the figure.

- A - =CONCATENATE (A4, " ", B4)
- B - =SUM (A4, B4)
- C - =A4&" "&B4

	A	B	C	D
1	ABC Company Ltd.			
2	Employee Details			
3	First Name	Last Name	Full Name	Address Line
4	Sithija	Sirwardhane	Sithija Sirwardhane	
5	Amalee	Mesgasthane		
6	Indrakum	Rarara		

Which of the above will you select to enter in C4 to get the Full Name, using the First Name and Last Name you have already entered in A4 and B4 as shown in the figure.

- (1) A and B only. (2) B and C only.
 (3) A and C only. (4) All A, B and C. (.....)

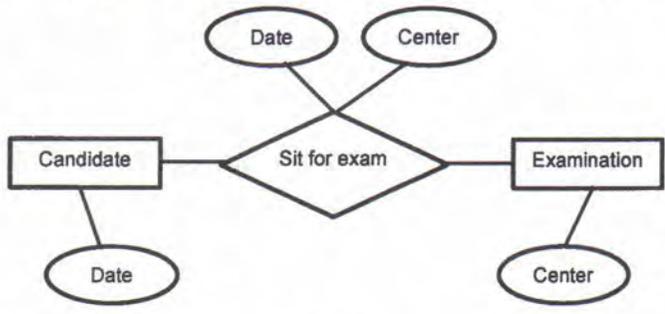
11. What can you do when saving a Powerpoint presentation if you have to show it in a computer which may not have the same font you used to create this presentation?

- (1) check compatibility (2) font embedding
 (3) check accessibility (4) font replacement (.....)



12. Which of following statements is true with regard to 'slide masters' in MS Powerpoint?
 (1) You can have multiple slide masters in one presentation.
 (2) Slide master saves information about the theme, contents and properties of the presentation.
 (3) A presentation may not have any slide Master.
 (4) Changes you do in the slide master affect all the slides of the presentation. (.....)

● Consider the following ER diagram to answer the questions 11 and 12.



13. Cardinality of the above ER diagram is
 (1) one to one. (2) one to many. (3) many to many. (4) many to one. (.....)

14. Which of the following correctly implements the above ER diagram in a relational database system?

- (1)

CandID	Date
--------	------

ExamID	Center
--------	--------
- (2)

CandID	Date
--------	------

ExamID	Date
--------	------
- (3)

CandID	
--------	--

ExamID	
--------	--

CandID	ExamID	Date	Center
--------	--------	------	--------
- (4)

CandID	
--------	--

ExamID	Date
--------	------

CandID	ExamID	Center
--------	--------	--------

 (.....)

15. A relational database table in 0-normal form can be converted to 1-normal form by reducing
- (1) duplicate values of its fields.
 (2) duplicate rows in the tables.
 (3) duplicate attributes in the tables.
 (4) all attributes which do not depend on the primary key. (.....)

16. Which of the following is **not** a database model?
 (1) Relational (2) Object-oriented
 (3) Network (4) Standard (.....)

17. Which of the following is true with respect to composite keys?
 (1) Value of an attribute of a composite key can be blank.
 (2) Each of the attributes in a composite key can uniquely identify records.
 (3) A foreign key, if available, should be a part of the composite key.
 (4) Composite key is necessary when any individual attribute cannot identify records uniquely. (.....)

18. Which of the following is a Data Definition Language (DDL) statement?
 (1) select from employee;
 (2) update age where employee = "E002";
 (3) insert into Emp values (EmpNumber="15102", EmpName="Sunil");
 (4) drop table employee; (.....)

19. Consider the following integrity constraints.
 A – Primary key
 B – Foreign key
 C – Unique
 D – Not duplicate
 Which of the above avoid data duplication?
 (1) A and B only (2) A and C only
 (3) A and D only (4) All A,B,C and D (.....)
20. A primary key of a relational database table can be replaced by an attribute available in
 (1) Candidate key. (2) Alternate key. (3) Composite key. (4) Foreign key. (.....)
21. A and B are attributes of a composite key. If, only the attribute B decides a non-key attribute C, there is,
 (1) transitive dependency (2) partial dependency
 (3) internal dependency (4) external dependency (.....)
22. The SQL statement which adds a table into a database is
 (1) MAKE TABLE. (2) ALTER TABLE.
 (3) DEFINE TABLE. (4) CREATE TABLE. (.....)
23. The SQL statement DROP TABLE,
 (1) deletes only the structure of a table. (2) deletes all the data and structure of a table.
 (3) creates an error. (4) deletes the first attribute. (.....)
24. To which layer of the OSI model of data communication systems does the router belong?
 (1) application layer (2) network layer (3) session layer (4) physical layer (.....)
25. Select the answer that contains the layers of OSI model arranged in the correct order.
 (1) application layer, session layer, network layer
 (2) network layer, data link layer, physical layer
 (3) physical layer, network layer, data link layer
 (4) network layer, physical layer, data link layer (.....)
26. What is the correct order in data encapsulation?
 (1) data, frame, segment, packet. (2) data, segment, frame, packet.
 (3) data, segment, packet, frame. (4) frame, packet, segment, data. (.....)
27. What protocol helps to find the hardware address of a local device in a network?
 (1) RARP (2) ARP (3) IP (4) ICMP (.....)
28. Which of the following is true with respect to IP address?
 (1) It identifies the computer uniquely.
 (2) It is used by the transport layer.
 (3) It identifies the connection to a network uniquely.
 (4) It helps the data link layer to check transmission errors. (.....)
29. Which of the following is true with respect to 'a frame' in a computer network?
 (1) It helps error checking at the application layer.
 (2) It contains only one packet.
 (3) A data packet can have one or more frames.
 (4) It is used by the data link layer to check communication errors. (.....)
30. Which of the following is true with respect to TCP/IP based Intranet?
 (1) It always assures the delivery of data to the destination.
 (2) It can be considered as a fault-tolerant system.
 (3) It provides a dedicated physical connection between the server and the destination.
 (4) Data transmission is impossible between a TCP/IP based intranet and a Novel Netware Intranet. (.....)



31. Which of the following is correct with respect to public and private keys used in data encryption?
- (1) Data encrypted by private key of a sender can only be decrypted by public key of the receiver.
 - (2) Data encrypted by public key of the sender can only be decrypted by the receiver's private key.
 - (3) Data should be encrypted using sender's public key so that the receiver can decrypt using receiver's public key.
 - (4) Sender's private key should be used for encryption so that the receiver can decrypt using its private key. (.....)
32. Which of the following is correct with regard to MD5 and SHA protocols used in computer networks?
- (1) Data encrypted using MD5 cannot be decrypted.
 - (2) Both MD5 and SHA can be used for data encryption only.
 - (3) Both MD5 and SHA can be used for data decryption only.
 - (4) Data encrypted using SHA cannot be decrypted. (.....)
33. Data sent by a sender having IP address will not be proceeded by the routers outside the network.
- | | |
|-----------------------|-------------------------|
| (1) 172 . 16 . 4 . 10 | (2) 192 . 248 . 24 . 15 |
| (3) 192 . 248 . 1 . 2 | (4) 248 . 168 . 2 . 4 |
- (.....)
34. DNS is normally used to
- (1) convert domain name into IP address.
 - (2) cache web pages.
 - (3) find the target network.
 - (4) find the next hop. (.....)
35. The Bus topology is physically implemented in an Ethernet network as a topology.
- (1) star
 - (2) complete
 - (3) ring
 - (4) hybrid (.....)
36. Hyper-text is a text dealt with.....
- (1) links.
 - (2) images.
 - (3) audio/video.
 - (4) tables. (.....)
37. Which of the following is a protocol related to email?
- (1) HTTP
 - (2) SMTP
 - (3) FTP
 - (4) TCP (.....)
38. WWW is a collection of
- (1) hyperlinked documents.
 - (2) databases.
 - (3) documenting tools.
 - (4) web servers. (.....)
39. Which of the following is used to test the connectivity between two devices attached to the internet?
- (1) ping
 - (2) telnet
 - (3) tracert
 - (4) rlogin (.....)
40. Which of the following is a valid network IP address?
- (1) 192 . 248 . 0 . 0
 - (2) 192 . 248 . 24 . 0
 - (3) 192 . 0 . 0 . 0
 - (4) 170 . 212 . 3 . 0 (.....)
41. What is the true statement with respect to sending an email?
- (1) The sender machine knows the existence of the receiver machine.
 - (2) The sender and the receiver machines are on-line
 - (3) The sender knows the availability of the email server.
 - (4) Mail will always be immediately sent to the receiver. (.....)
42. WAMP is used to
- (1) send emails.
 - (2) send SMS.
 - (3) provide a web server.
 - (4) scan email for viruses. (.....)

43. Which of the following is a major weakness in Waterfall model of system development?
(1) Process invisibility.
(2) It does not support project management.
(3) It requires well defined set of requirements to begin with.
(4) Resource management is difficult. (.....)

44. Which of the following SDLC model does **not** support process iteration?
(1) waterfall (2) agile (3) spiral (4) RAD (.....)

45. The objectives of unit testing is to assure that
(1) the system is error free.
(2) the program of the system works according to the specifications.
(3) the program of the system is free of syntax errors.
(4) the program of the system is free of logical errors. (.....)

46. Consider the following stakeholders of a software development project
A - programmer
B - system analyst
C - client
Who is/are involved in the acceptance testing?
(1) A and B only (2) A and C only (3) B and C only (4) All A, B and C (.....)

47. Consider the following diagrams.
A - Structural diagram
B - Data flow diagram
C - Use case diagram
Which of the above represent the diagrams available in UML?
(1) A and B only (2) B and C only (3) A and C only (4) All A, B and C (.....)

● Consider the following user requirements for a mobile phone to answer questions 48 – 50.

- A - A user shall be able to make a call
- B - A user should be able to receive a call
- C - The weight of the phone shall not exceed 500g

48. Which of the above represent the functional requirement(s)?
(1) A and B only (2) A and C only (3) B and C only (4) all A, B and C (.....)

49. What is/are (a) **non-functional** requirement(s)?
(1) A only (2) B only (3) C only (4) A and B only (.....)

50. What is/are (a) mandatory functional requirement(s)?
(1) A only (2) B only (3) C only (4) A and B only (.....)

● Write the answers to questions from No. 51 to 65 in the spaces provided.

51. Write the possible range in decimal if the integers are represented using sign magnitude representation in 16 bits.

.....

52. Convert 16.16625_{10} into Octal representation.

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53. Briefly explain each of the following metrics used to measure the performance of the Central Processing Unit (CPU).

(i) Throughput

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(ii) Turnaround time

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.....

(iii) Response time

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.....

54. CPU burst time for four processes P1, P2, P3 and P4 are given below.

Process	P1	P2	P3	P4
CPU burst time	20	4	3	6

Calculate the average turnaround time for a process when 5 ms time quantum is given to Round Robin Scheduling.

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55. Consider the 'EMPLOYEE' table given below.

EMP No	EMP Name	Designation	Department	Basic Salary
E 001	Perera	Manager	FIN	51 000
E 002	Alwis	Clerk	FIN	33 000
E 003	Nimal	Clerk	ACC	30 000
E 004	Silva	Engineer	PROD	50 000

Write SQL statements for each of the following requirements.

(i) To add a new employee with the details given in the order, E 007, Amal, Sys.Eng, IT, 50 000.

.....

(ii) To get the all details of all the employees having a Basic Salary of Rs. 40 000 or higher.

.....

(iii) To get the number of employees and the total of basic salary of each branch.

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56. Briefly explain the following terms with respect to a database.

(i) Partial dependency

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.....

(ii) Transitive dependency

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57. Given below is a table with details of a certain medical institute.

Patient No.	Patient Name.	Treatment	Charge (Rs.)	Treatment Date
1005	Nimal Perera	Blood Test	200.00	10.02.2015
1210	Deepika Nilmini	Urine Test	300.00	11.02.2015
1403	Sanjaya Alwis	X - ray	450.00	12.02.2015
1005	Nimal Perera	X - ray	450.00	12.02.2015
1005	Nimal Perera	Urine Test	300.00	12.02.2015
1005	Nimal Perera	Allergy Test	500.00	

(i) What is the present normal form of the above table? Justify your answer.

.....
.....

(ii) Normalize the above table to 3NF.

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58. Assume that the network address assigned to your company is 192.150.111.0.

(i) If the subnet mask is 255.255.255.224, find the answers to the below, mentioning the steps clearly.

(a) The number of usable sub-nets

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(b) The number of hosts and the address ranges for each of the above sub-nets

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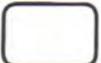
(ii) If these sub-nets are named consecutively as A,B,C ..., find the subnets to which the following IP addresses can be assigned.

- | | |
|---------------------|---------------------|
| (a) 192.150.111.10 | (b) 192.150.111.66 |
| (c) 192.150.111.100 | (d) 192.150.111.200 |
| (e) 192.150.111.220 | (f) 192.150.111.251 |

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59. Compare IPv4 and IPv6 in point form.

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60. Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) are two data transmission protocols. Briefly explain when is it appropriate to use each of them giving suitable examples.

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61. Briefly explain the following

(i) Phishing

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(i) Pharming

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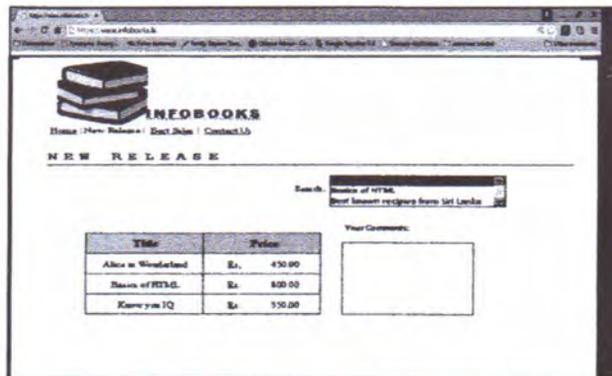
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(i) Spoofing

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62. Info books is a book sales enterprise. A page from its web site is given below.



(i) Write the HTML code to display the index.html when the 'Home' button is clicked.

.....

.....



(ii) In the subfolder 'image' locator in the folder 'web', where the index.html is saved, the logo of the enterprise is saved as Books.jpg. Write the HTML code to show this logo.

.....
.....
.....
.....

(iii) Complete the following xml code to show the titles and the price of books in the table of this web page.
<.....xml version = "1.0">

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63. Mention **three** possible security threats to a computer network.

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64. Describe briefly **two** precautions to avoid the security threats you mentioned in question 64 above.

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65. A soft drinks manufacturing company issues soft drinks to retail sellers once a week. Sellers should have been registered with the company to buy soft drinks. Sellers usually place orders for soft drinks at the order clerk over the phone. A single seller can make several orders per week. Orders are confirmed only if stocks exist. Or else, alternatives are agreed upon. The order clerk sends copies of the orders to the stores and the cashier. When payments are settled, invoice is issued by the cashier in two copies, one for the stores and the other for the seller. The stores issue goods to the seller together with a goods issue notice to be produced at the gate.

Create the level-0 DFD to represent the above data and processes.

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