

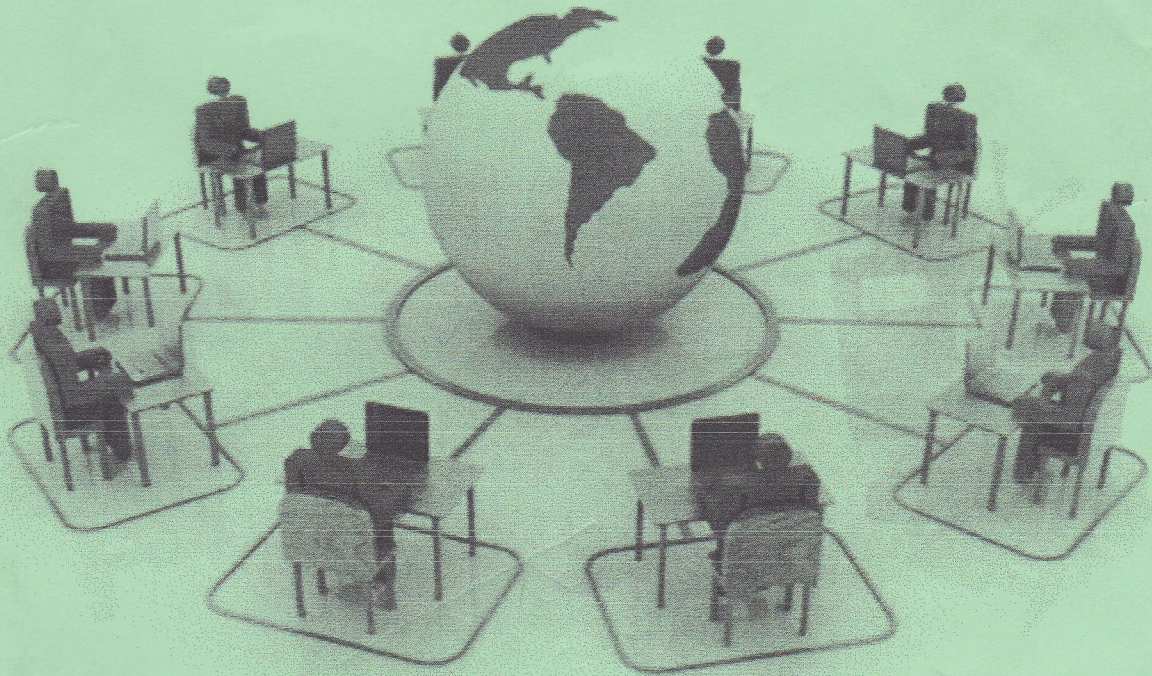


Department of Examinations - Sri Lanka

G.C.E. (A/L) Examination - 2017

20 - Information and Communication Technology

Marking Scheme



This has been prepared for the use of marking examiners. Changes would be made according to the views presented at the Chief/Assistant Examiners' meeting.

Amendments to be included.

20 - Information and Communication Technology

Distribution of marks

Paper I

Time Duration 02 hours

Number of Questions 50

Total Marks $50 \times 2 = 100$

Paper II

Time Duration 03 hours

Paper A - Structured Questions

Number of Questions 04

$$04 \times 10 = 40$$

Paper B - Essay Questions

Number of Questions 04

$$04 \times 15 = 60$$

Paper II Total marks = $40 + 60 = 100$

$$\begin{aligned} \text{Final marks} &= \frac{\text{pape I} + \text{Paper II}}{2} \\ &= \frac{100 + 100}{2} = 100 \end{aligned}$$

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கைப் பரீட்சைத் திணைக்களம்

අ.පො.ස. (උ.පෙළ) විභාගය/ க.பொ.த. (உயர் தர)ப் பரீட்சை - 2017

විෂය අංකය
பாட இலக்கம்

20

විෂය
பாடம்

තොරතුරු හා සන්නිවේදන තාක්ෂණය

ලකුණු දීමේ පටිපාටිය/புள்ளி வழங்கும் திட்டம்
[පත්‍රය/பத்திரம் I

ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.	ප්‍රශ්න අංකය வினா இல.	පිළිතුරු අංකය விடை இல.
01.	05	11.	02	21.	03	31.	04	41.	05
02.	01	12.	04	22.	04	32.	01	42.	02
03.	05	13.	All	23.	01	33.	05	43.	04
04.	04	14.	01	24.	03	34.	04	44.	05
05.	03	15.	05	25.	05	35.	05	45.	02
06.	01	16.	04	26.	2 or 4	36.	05	46.	03
07.	05	17.	05	27.	01	37.	03	47.	05
08.	All	18.	03	28.	05	38.	03	48.	03
09.	01	19.	04	29.	02	39.	05	49.	05
10.	05	20.	03	30.	02	40.	02	50.	03

❖ විශේෂ උපදෙස්/ விசேட அறிவுறுத்தல் :

එක් පිළිතුරකට/ ஒரு சரியான விடைக்கு 02 ලකුණු බැගින්/புள்ளி வீதம்

මුළු ලකුණු/மொத்தப் புள்ளிகள் 2 × 50 = 100

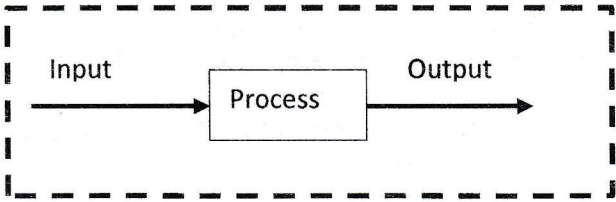
Information and Communication Technology (20)

Paper II Part A

2017

Q. No.	Model Answer	Marks
1.	<p style="text-align: center;">L1 DED of Sales Information System of Bookland</p> <pre> graph TD subgraph Entities C1((Customer)) O1((Owner)) end subgraph Processes P1[1 Sales Assistant Handle enquiries & hold-on requests] P2[2 Cashier Handle payments & inventory] P3[M1 Inventory] end subgraph DataStores DS1[M1 Inventory] DS2[M2 Sales] TS1[T1 Hold-on Requests (M)] end C1 -- "book enquiry" --> P1 P1 -- "reply to the enquiry" --> C1 P1 -- "personal details" --> C1 P1 -- "book status" --> TS1 TS1 -- "hold-on request" --> P1 P1 -- "book details" --> DS1 DS1 -- "book details" --> P1 P1 -- "hold-on request" --> TS1 TS1 -- "hold-on request" --> P2 P2 -- "payment" --> C1 C1 -- "payment receipt" --> P2 P2 -- "sales report" --> O1 O1 -- "details of books" --> P2 P2 -- "copy of the payment receipt" --> DS2 DS2 -- "Sales" --> P2 P2 -- "details of books" --> O1 P2 -- "hold-on request" --> TS1 TS1 -- "Hold-on Requests" --> P2 </pre> <p>The diagram illustrates the data flow for the L1 DED of Sales Information System of Bookland. It includes external entities (Customer and Owner), internal processes (Sales Assistant, Cashier, and Inventory), and data stores (M1, M2, and T1). The flow is as follows: Customer sends a book enquiry to Sales Assistant; Sales Assistant replies to the enquiry and provides personal details to the Customer. Sales Assistant also sends book status to T1 (Hold-on Requests) and receives hold-on requests from T1. Sales Assistant sends book details to M1 (Inventory) and receives book details from M1. Sales Assistant sends hold-on requests to T1 and receives hold-on requests from T1. Sales Assistant sends hold-on requests to Cashier, who then sends a payment receipt to the Customer. Cashier sends a sales report to the Owner and sends a copy of the payment receipt to M2 (Sales). Cashier also sends details of books to the Owner and receives details of books from the Owner. Cashier sends hold-on requests to T1 and receives hold-on requests from T1.</p>	<p style="text-align: center;">Each blank filled in with the correct answer 1 mark</p>

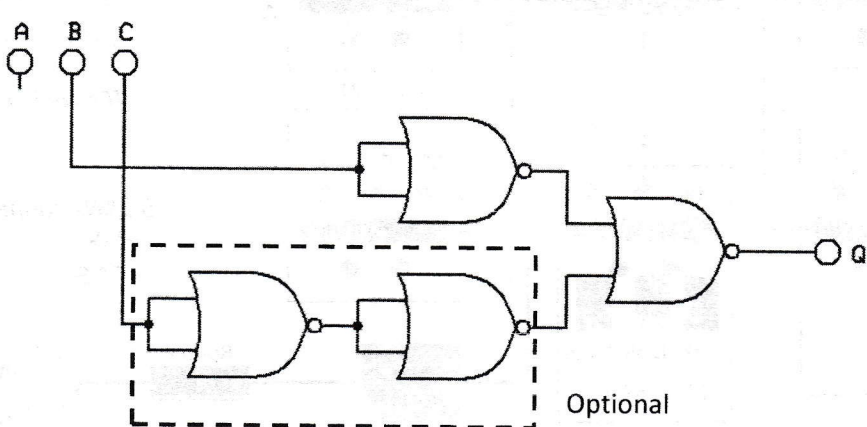
10

<p>3.(b).(ii)</p>	<p>update student set address = '13, School Lane, Jaffna' } A where student_no like '10001%' } B</p> <p>or</p> <p>update student set address = '13, School Lane, Jaffna' } A where student_no like '10001' } B</p> <p>update student set address = '13, School Lane, Jaffna' } A where student_no = '10001' } B (Note: The = sign only works for varchar type attributes)</p> <p>Or</p> <p>update student set address = '13, School Lane, Jaffna' } A (Assumption: Only one student record in the database) } B</p>	<p>[A only] 2 or 0 [A and B] 3</p> <p style="text-align: right;">3</p>
<p>4.(a).(i)</p>	 <p>Rectangle is System boundary</p> <p>Rectangle shape system boundary</p>	<p style="text-align: right;">1</p>
<p>4.(a).(ii)</p>	<p>In closed system both input and output are available within the system.</p> <p>Or</p> <p>A sentence with the same meaning</p>	<p>4 or 0</p> <p style="text-align: right;">4</p>
<p>4.(b)</p>	<p>person(NICNo) mobilePhone(TelephoneNo, NICNo)</p> <p>Each correct relation with attributes 1 mark Each primary key 1 mark (only if the relation is correct) 1 : M relationship (No more than two relations)</p> <p>Note: 1. If tables are drawn 1 mark for both correct tables. 2. <u>Any form of words</u> given in the question is acceptable</p>	<p>2 2 1</p> <p style="text-align: right;">5</p>

Information and Communication Technology (20)

Paper II Part B

2017

Q. No.	Model Answer	Marks																																				
1.(a)	Air-conditioner (Q) [Define output]	1																																				
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td>A</td><td>B</td><td>C</td><td>Q</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>1</td><td>0</td><td>1</td><td>0</td></tr> <tr><td>1</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>0</td></tr> </table> [Correct input columns + 8 combinations] <i>A, B, C</i>	A	B	C	Q	0	0	0	0	0	0	1	0	0	1	0	1	0	1	1	0	1	0	0	0	1	0	1	0	1	1	0	1	1	1	1	0	1+1
	A	B	C	Q																																		
	0	0	0	0																																		
	0	0	1	0																																		
	0	1	0	1																																		
	0	1	1	0																																		
	1	0	0	0																																		
	1	0	1	0																																		
	1	1	0	1																																		
1	1	1	0																																			
	[Correct output column]	2 or 0 (No Partial Marks)																																				
	$Q = A'.B.C' + A.B.C'$ $= B.C'.(A'+A)$ $= B.C'$	3																																				
	distributive law } complement law }	1																																				
	[At least one correct rule]	1																																				
	[Solution]	1																																				
		3 or 0																																				
	[Circuit]	3 or 0																																				
	Optional	13																																				
1.(b)	Yes. Input that represents Switch (A) is not in the Boolean expression/circuit/solution. Therefore, it is not required for the operation of the air-conditioner.	1 1																																				

Agree 2/2 marks
 2/2 marks Yes
 2/2 marks
 2 marks

2.

Assume that the entire private address range is used (it can be any range)

Since there are 4 subnets, it is required to divide the address range into 4 segments.

For this, add two more bits to the subnet mask.

Subnet mask length becomes 10.

11111111.11000000.00000000.00000000

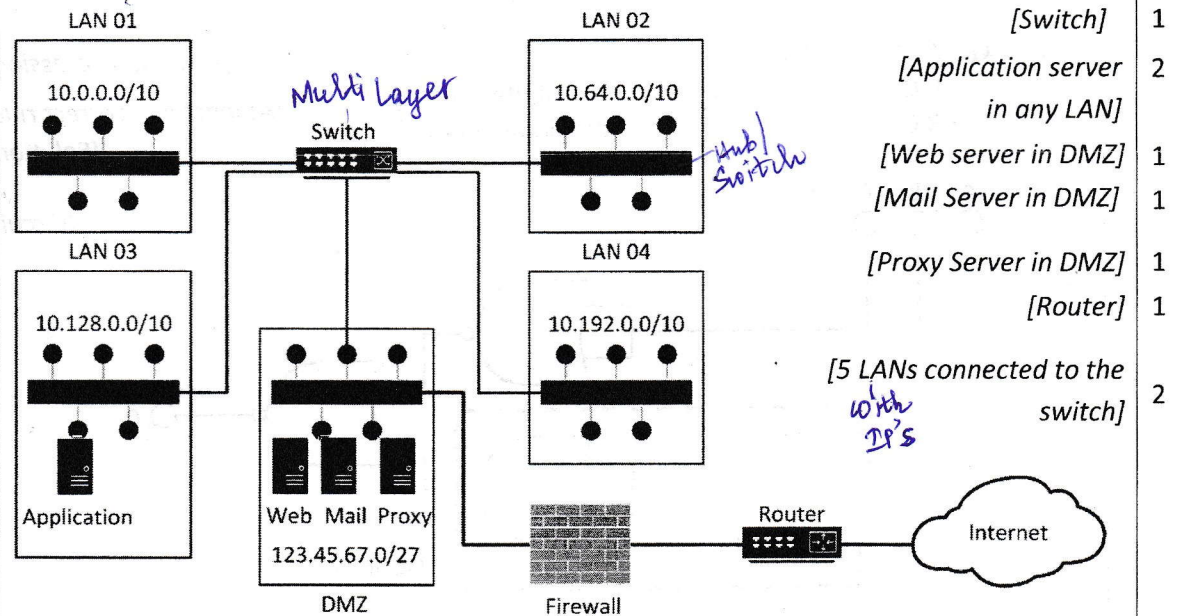
Therefore, the 4 subnets would be:

- | | | |
|--|-----------|---|
| 1. 00001010.00000000.00000000.00000000 = 10.0.0.0/10 | } [1 x 4] | 4 |
| 2. 00001010.01000000.00000000.00000000 = 10.64.0.0/10 | | |
| 3. 00001010.10000000.00000000.00000000 = 10.128.0.0/10 | | |
| 4. 00001010.11000000.00000000.00000000 = 10.192.0.0/10 | | |

(if they decide to use /24 ranges, they should assume that 255 addresses are enough for each subnet. Then they should show the selection of /24 ranges.)

Note: If the selected ranges are shown in the diagram these 4 marks can be given

 Needed Devices: **05 Hubs, Switch, Router, Firewall, Web Server, Mail Server, Proxy server, Application Server.**



Local Area Area Connect Router
 Router
 5 LANs connected to the switch
 (Ports)
 Normally

Since any computer in any subnetwork can access resources in all subnetworks, the application server can be established in any subnetwork. Since it is for internal clients, it should not be located in the DMZ.

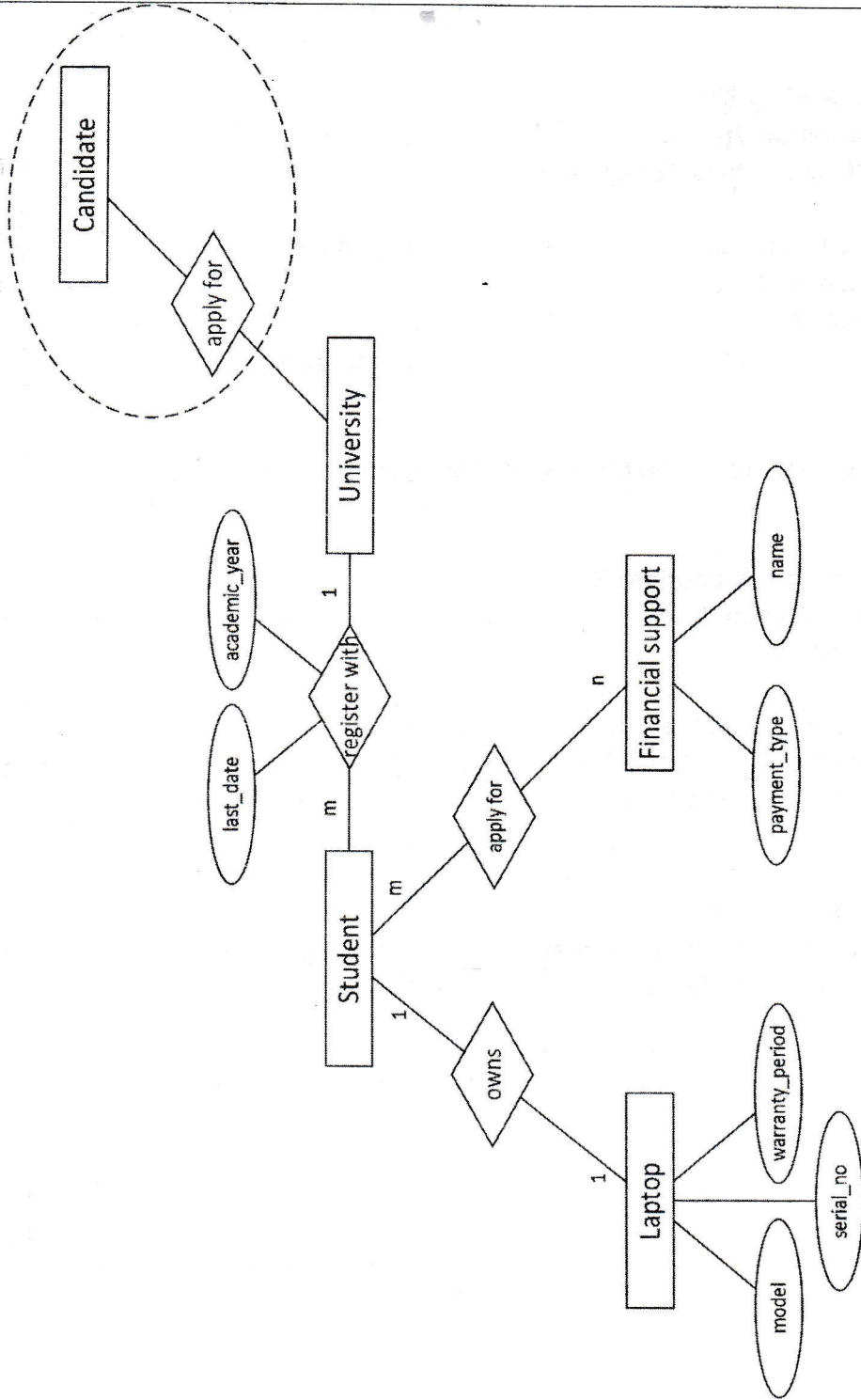
Note: 1.Proxy Server could be directly connect to the Switch

 When the packet goes to the proxy server, its source IP address is rewritten with the public IP address of proxy server. 2

3.(a)	G2C or Government to Consumer Note: Government to Citizen only 2 marks	3 3
3.(b)	G2B or G2E, It is a service provided in online by the Government to Business or Employees.	1 1 2
3.(c)	Because it is a service provided by business to government . Therefore it is B2G.	4 1 5
3.(d)	Law: To prepare fine calculations mechanism according to the (<i>criticality of the identified place</i>). Epidemic Control Division: (To develop formula to measure the <i>criticality of the identified place related to dengue breeding</i>).	3 2 5

<p>4.(a)</p>	<pre> graph TD Start([start]) --> Input[/Read house hold no (hno) Past Reading (rpast) Present Reading (rpresent)/] Input --> Calc1[unitsUsed = rpresent - rpast payment = 0] Calc1 --> Dec{unitUsed > 64?} Dec -- no --> Calc2[payment = unitsUsed * 5.00] Dec -- yes --> Calc3[payment = 64 * 5.00 + (unitUsed - 64) * 10.00] Calc2 --> Print[/print payment/] Calc3 --> Print Print --> End([end]) </pre>	<p>[Input] 1</p> <p>[Calculation] 1</p> <p>[Condition] 1</p> <p>[Calculation] 1</p> <p>[Calculation] 1</p> <p>[Print] 1</p> <p>Overall (start/end) 1</p> <p style="text-align: center; border: 1px solid black; border-radius: 50%; width: 30px; margin: 0 auto;">7</p>
<p>4.(b)</p>	<pre> hno = input("Enter house hold number ->") rpast = int(input("Last meter reading ->")) rpresent = int(input("Present meter reading ->")) unitsUsed = rpresent - rpast if unitsUsed > 64: payment = 64 * 5.00 + (unitsUsed - 64) * 10.00 else: payment = unitsUsed * 5.00 print(payment) </pre> <p>Assumptions : The assumptions are based on the programme</p> <ul style="list-style-type: none"> • The present meter reading is higher than the past meter reading • Integer values should be entered for present and past meter readings 	<p>[Input] 1</p> <p>[if with correct computation] 1</p> <p>[else with correct computation] 1</p> <p>[Print] 1</p> <p style="text-align: center; border: 1px solid black; border-radius: 50%; width: 30px; margin: 0 auto;">4</p>
<p>4.(c)</p>	<pre> def writetofile(houseNo, rpast, rpresent, charge): f = open("deb.txt", "a") print(houseNo, rpast, rpresent, charge, file=f, sep=",") f.close() </pre> <p>Note: f.write(str(houseNo)+ " "+ str(rpast)+ " "+ str(rpresent) + " "+ str(charge)) f.write("%s %s %s %s" % (houseNo, rpast, rpresent, charge))</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p style="text-align: center; border: 1px solid black; border-radius: 50%; width: 30px; margin: 0 auto;">4</p>

5.



Entities 1x 4

Relation with correct cardinality 1x3

Acceptable attributes attached to any entity 1 mark each maximum 5

Attributes attached to relation 1x2

Circled section

4
3
5
2
1

<p>6.(a)</p>	<pre> <html > <head> <meta charset="utf-8"> <title>Information</title> <style> OR <style type="text/css"> li{ font-family: calibri; font-size: 14pt; color: red; list-style: square; } </style> OR <link rel="stylesheet" type="text/css" href="def.css"> </head> <body> <h1>Student Art Competition</h1> <h2>Theme: Litter on the environment </h2> <h3>PRIZES</h3> 1st place Rs. 10,000/= 2nd place Rs. 7,500/= 3rd place Rs. 5,000/= <h3>ENTRY FORM</h3> <p>Please fill and submit this online entry form to enter the competition. </P> </body> </html> </pre>	<p>(3)</p> <p>4</p> <p>(3)</p> <p>2</p> <p>1</p> <p>2</p> <p>9</p>
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6.(b)	<pre> <html > <head> <meta charset="utf-8"> <title>Entry Form</title> </head> <body> <h1>Art Competition Online Entry Form 2017</h1> <h3>Theme: Litter on the environment</h3> <form method = "get" action = "script.php"> Name: <input type="text" name="name" > <p>Gender: <input type="radio" name="sex" value="male" > Male <input type="radio" name="sex" value="female" > Female </p> <p>Grade Category <select name="ageGroup"> <option value="g1">Grade 1 - 2</option> <option value="g2">Grade 3 - 6</option> <option value="g3">Grade 7 - 10</option> <option value="g4">Grade 11 - 13</option> </select></p> <p>Art media: </p> <input type="checkbox" name="media1" value="Colour" > Water Colours
 <input type="checkbox" name="media2" value="Pencils" > Colour Pencils
 <input type="checkbox" name="media3" value="Crayon" > Crayon
 <input type="checkbox" name="media4" value="Chalk" > Chalk <p><input type = "reset" value = "Clear your Entries"></p> <p><input type="submit" value="Submit" ></p> </form> </body> </html> </pre>	<p>[<form> and </form>] 1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>
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