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Cambridge Assessment International Education

Cambridge International AS & A Level

INFORMATION TECHNOLOGY **9626/04**

Paper 4 Advanced Practical **March 2020**

MARK SCHEME

Maximum Mark: 110

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the March 2020 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Task 1

E	F	G
Grade Thresholds		
A	**B**	**C**
90	70	40

E	F	G
Grade Thresholds		
A	**B**	**C**
87	65	37

Allow either set of data

Grade thresholds table E2:G4 – cells sizes equal Gridlines visible and consistent thickness	1
Correct **Text and Data** formatted as QP Text=Bold, All=Centred H&V	1

I	J	K	L
Number of each grade			
A	**B**	**C**	**Fails**
23	34	48	65

Number of each grade table I2:L4 – cells sizes equal Gridlines visible & consistent thickness	1
Correct Text formatted as QP – Bold – Centred H&V *data can be in any format or position*	1

			Marks					Grade awarded					
6													
7	**Forename**	**Surname**	**Programming**	**Computer Systems**	**Information Systems**	**Data Modelling**	**Web Technologies**	**Programming**	**Computer Systems**	**Information Systems**	**Data Modelling**	**Web Technologies**	**Passes**

Forename + Surname = Bold, Centred Vertically any *Horizontal alignment allowed*	1
Marks table, gridlines consistent, heading "**Marks**" – Bold – Centred H&V	1
Marks table Subjects – Bold – Centred – Align bottom – Wrapped not split	1
Grade awarded table, gridlines consistent "**Grade awarded**" Bold – Centred H&V	1
Grade awarded table Subjects – Bold – Centred – Align bottom – Wrapped not split	1

	C	D	E	F	G	H	I	J	K	L	M	N
6			**Marks**					**Grade awarded**				
7	**Programming**	**Computer Systems**	**Information Systems**	**Data Modelling**	**Web Technologies**		**Programming**	**Computer Systems**	**Information Systems**	**Data Modelling**	**Web Technologies**	**Passes**
8	95	38	41	89	90		A	F	C	B	A	4

```
=IFS(C8="abs","F",C8>=$E$4,"A",C8>=$F$4,"B",C8>=$G$4,"C",C8<$G$4,"F")
```

```
=IF(C8>=87,"A",C8>=
```

IFS() used for student grades *this mark is for efficiency to avoid nested IF()s*	1
Absolute references to Threshold values ($E$4, $F$4, $G$4)	1

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Forename	Surname	Programmir	Computer Systems	Information Systems	Data Modell	Web Technologie
Livia	Barese	95	38	41	89	90
Curzio	Baresi	45	87	72	39	36
Lorna	Calabrese	42	38	67	37	91
Rosina	Cattaneo	98	96	41	37	99
Nino	De Luca	15	97	35	54	36
Immacolata	Endrizzi	28	38	23	54	55
Tranquillo	Ferri	57	64	16	89	52

Programmir	Computer Systems	Information Systems	Data Modell	Web Technologie	Passes
A	F	C	B	A	4
C	B	B	F	F	3
C	F	C	F	A	3
A	A	C	F	A	4
F	A	F	C	F	2
F	F	F	C	C	2
C	C	F	B	C	4

Conditional formatting Green/Red **(Fill)** Results must match whichever threshold values are shown	1

Example solution

=COUNTIF(I8:M8,"<"&"F")

=COUNTIF(I8:M8,"<>F")

=5-COUNTIF(I8:M8,"F")

=COUNTIF(I8:M8,"A")+COUNTIF(I8:M8,"B")+COUNTIF(I8:M8,"C")

~~=COUNTIF(C8:G8,">37")~~

Valid method for Student passes (excluding the use of numeric values)	1
Correct number of Student passes	1

Number of each grade			
A	B	C	Fails
23	34	48	65

Number of each grade			
A	B	C	Fails
31	38	52	49

Example solution

Number of each grade			
A	B	C	Fails
=COUNTIF($I$8:$M$41,E3)	=COUNTIF($I$8:$M$41,F3)	=COUNTIF($I$8:$M$41,G3)	=COUNTIF($I$8:$M$41,">"&G3)

Number of each grade			
A	B	C	Fails
=SUM(Q8:U8)	=SUM(Q9:U9)	=SUM(Q10:U10)	=SUM(Q12:U12)

Number of each grade all cells use COUNTIF($I$8:$M$41, ..) or all cells use SUM(Qn:Un)	1
Correct numbers (23,34,48,65) or (31,38,52,49)	1

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	P	Q	R	S	T	U
6		Modules				
		Programming	Computer Systems	Information Systems	Data Modelling	Web Technologies
	Number of A grades	3	6	5	3	6
	Number of B grades	8	4	6	9	7
7	Number of C grades	9	11	10	7	11
	Number of Passes	20	21	21	19	24
8	Number of Fails	14	13	13	15	10

	P	Q	R	S	T	U
		Modules				
		Programming	Computer Systems	Information Systems	Data Modelling	Web Technologies
	Number of A grades	6	7	5	5	8
	Number of B grades	8	6	9	9	6
	Number of C grades	9	16	9	8	10
	Number of Passes	23	29	23	22	24
	Number of Fails	11	5	11	12	10

9	Table inserted **P6:U12** – gridlines consistent for all cells	1
10	Heading = **Modules** – Bold, Centred horizontally and vertically	1
11	**Subject** labels inserted and spelled correctly including case	1
12	**Subject** labels Centred, aligned to bottom, Wrapped – not split	1
	"**Number of …**" row labels spelled correctly *(including case)*	1
	"Number of …" row labels – Right aligned	1

Example solutions

	Modules				
	Programming	Computer Systems	Information Systems	Data Modelling	Web Technologies
Number of A grades	=COUNTIF(I$8:I$41,"A")	=COUNTIF(J$8:J$41,"A")	=COUNTIF(K$8:K$41,"A")	=COUNTIF(L$8:L$41,"A")	=COUNTIF(M$8:M$41,"A")
Number of B grades	=COUNTIF(I$8:I$41,"B")	=COUNTIF(J$8:J$41,"B")	=COUNTIF(K$8:K$41,"B")	=COUNTIF(L$8:L$41,"B")	=COUNTIF(M$8:M$41,"B")
Number of C grades	=COUNTIF(I$8:I$41,"C")	=COUNTIF(J$8:J$41,"C")	=COUNTIF(K$8:K$41,"C")	=COUNTIF(L$8:L$41,"C")	=COUNTIF(M$8:M$41,"C")
Number of Passes	=SUM(Q8:Q10)	=SUM(R8:R10)	=SUM(S8:S10)	=SUM(T8:T10)	=SUM(U8:U10)
Number of Fails	=COUNTIF(I$8:I$41,"F")	=COUNTIF(J$8:J$41,"F")	=COUNTIF(K$8:K$41,"F")	=COUNTIF(L$8:L$41,"F")	=COUNTIF(M$8:M$41,"F")

Valid method for Number of A, B, C grades COUNTIF (Rows **8:41** – Columns **I:M**) for each grade	1
Passes + Fails = 34 for each subject	1
Valid method for Number of Passes SUM(Rows8:10 , Cols Q:U) *or valid method using* **reference to rows 8:41**	1
Valid method for Number of Fails Valid method using reference to rows 8:41	1

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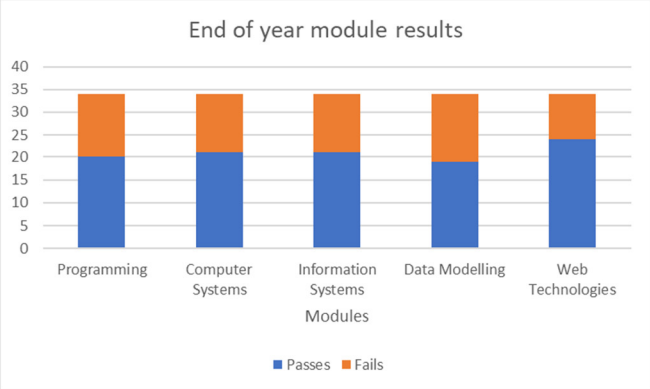
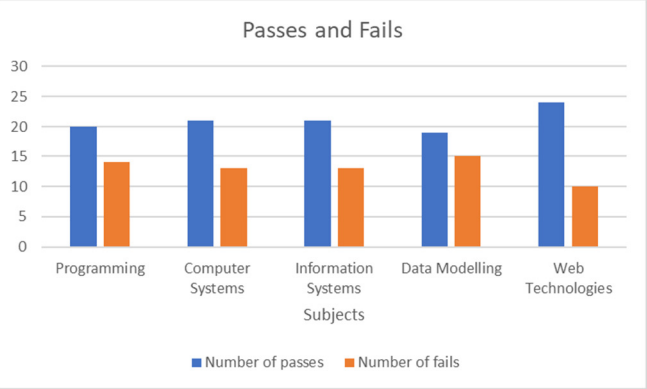
	Modules				
	Programming	Computer Systems	Information Systems	Data Modelling	Web Technologies
Number of Passes	20	21	21	19	24
Number of Fails	14	13	13	15	10

Grade Thresholds		
A	B	C
90	70	40





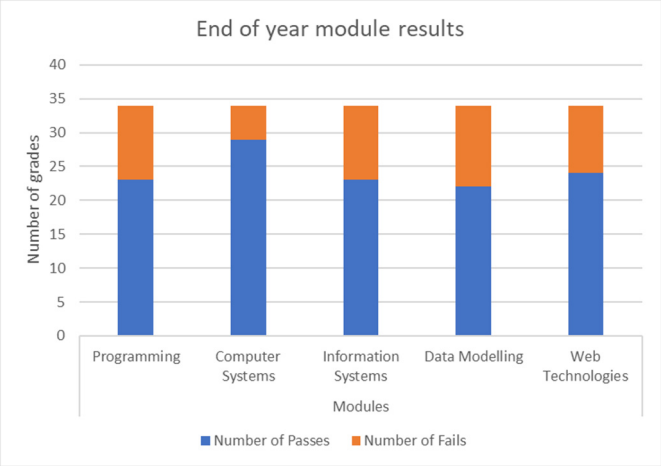
1st Chart

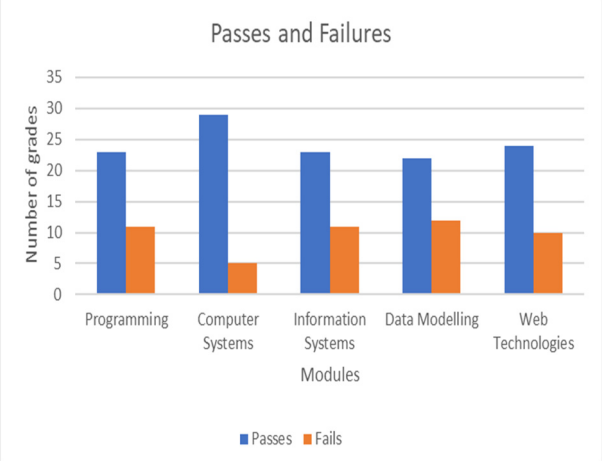
Pass/Fail data used for each module *Programming 20/14*	1
Clustered or Stacked Bar/Column chart is used	1
Pass/Fail **Series** is identified in a **legend**	1
Module names are visible **as column labels**	1
Horizontal Axis has a suitable label *(Modules/subjects etc.)*	1
An appropriate title is used – *refers to **Pass/fail/results***	1

	Modules				
	Programming	Computer Systems	Information Systems	Data Modelling	Web Technologies
Number of Passes	23	29	23	22	24
Number of Fails	11	5	11	12	10

Grade Thresholds		
A	B	C
87	65	37

2nd Chart





Pass/Fail data used for each module	*Programming 23/11*	1
Both charts same **correct** type		1
Printed to pdf		1

[35]

Task 2

End·of·year·1·module·results¶

Name:·{·MERGEFIELD·"Forename"·}·{·MERGEFIELD·"Surname"·}¶

Module¤	Programming¤	Computer·Systems¤	Information·Systems¤	Data·Modelling¤	Web·Technologies¤
Marks¤	{·MERGEFIELD·"Programming"·}¤	{·MERGEFIELD·Computer_Systems·}¤	{·MERGEFIELD·Information_Systems·}¤	{·MERGEFIELD·"Data_Modelling"·}¤	{·MERGEFIELD·Web_Technologies·}¤
Grade¤	{·MERGEFIELD·"Programming1"·}¤	{·MERGEFIELD·Computer_Systems1·}¤	{·MERGEFIELD·Information_Systems1·}¤	{·MERGEFIELD·Data_Modelling1·}¤	{·MERGEFIELD·Web_Technologies1·}¤

¶

Passes¤	Fails¤
{·MERGEFIELD·Passes·}¤	{·=5-{·MERGEFIELD·Passes·}}¤

{·IF·{·MERGEFIELD·Passes·}·=·4·"Please·contact·your·personal·tutor·to·discuss··a·resit·for:·{·IF·{·MERGEFIELD·Programming1·}·=·"F"·"Programming"·""·{·IF·{·MERGEFIELD·Computer_Systems1·}·=·"F"·"Computer·Systems"·""·{·IF·{·MERGEFIELD·Information_Systems1·}·=·"F"·"Information·Systems"·""·{·IF·{·MERGEFIELD·Data_Modelling1·}·=·"F"·"Data·Modelling"·""·{·IF·{·MERGEFIELD·Web_Technologies1·}·=·"F"·"Web·Technologies"·""·}·"·}·IF·{·MERGEFIELD·Passes·}·=·5·"Congratulations·for·a·successful·year."·"Please·contact·your·personal·tutor·to·dicuss·your·future."·}"·}¶

Marks Mergefields are correctly **named** and inserted	1
Grade and **Passes** Mergefields are correctly **named** and inserted	1
Fails Mergefield or **valid** calculation inserted *(Must match the results shown in the "Notifications" letters)*	1
Conditional fields are **Nested**	1

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There are 34 letters in the Notifications file	1
Forename and Surname are correctly placed and spaced	1
The correct Marks are shown in all 5 cells	1
The corresponding Grades are shown in all 5 cells	1
The number of passes is shown in the correct cell and matches the grades shown	1
Number of Passes + Fails = 5 *(if correct and not the same for all)*	1
Example results	
1. Livia "**Congratulations for a successful year**. " *not if all - allow misspellings*	1
2. Curzio **"Please contact your personal tutor to arrange for a resit for: Web Tech"**	1
3,4. The text *Matches the Results* - **all 3 options must be seen for this mark**	1
5. Nino "**Please contact your personal tutor to discuss your future. "**	1
All text is complete and correct in all letters. The letters are fit for purpose	1

[15]

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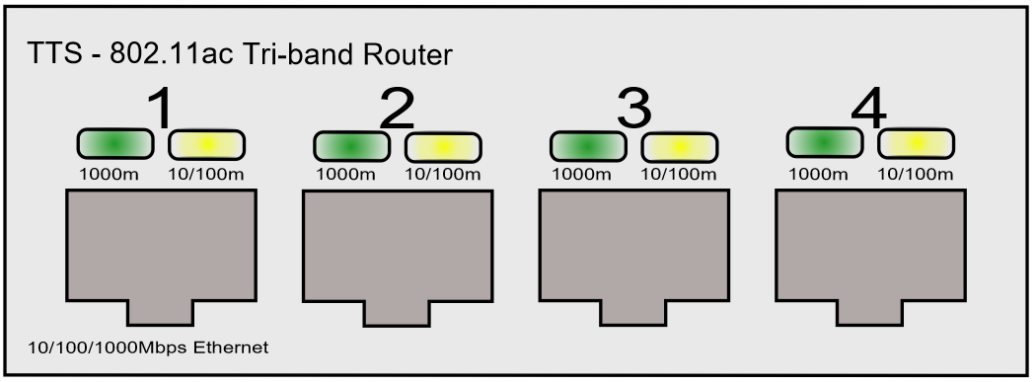
Task 3



The panel is Grey (*with an outline)*	1
Correct Model text is shown (*TTS-802.11ac Tri-band Router* – ***100% correct)***	1
Correct bottom spec label is shown (*10/100/1000 Mbps Ethernet* ***– 100% correct)***	1
There are 4 *approximately* correctly shaped and consistent RJ45 sockets shown	1
Each socket is **combined** with a single clear outline	1
Each socket has a uniform dark grey/brown fill	1
All the sockets are the same size and appear to be **duplicated**	1
8 consistent **oval or rounded corner** lights shown	1
There are Green and Yellow alternate fills for the lights	1
Radial fills are used for the lights	1
A clear outline to lights is visible	1
The numbers 1–4 are inserted as shown	1
4 × (**1000m 10/100m**) consistent labels are shown and appear to be **duplicated**	1
All Lights, Labels and **numbers** are **aligned correctly** and **centred** on each socket	1
All Sockets, Text, Labels are in reasonable proportions	1
The Sockets are evenly spaced in the panel	1
Image is saved as **Panel** in **SVG format**	1

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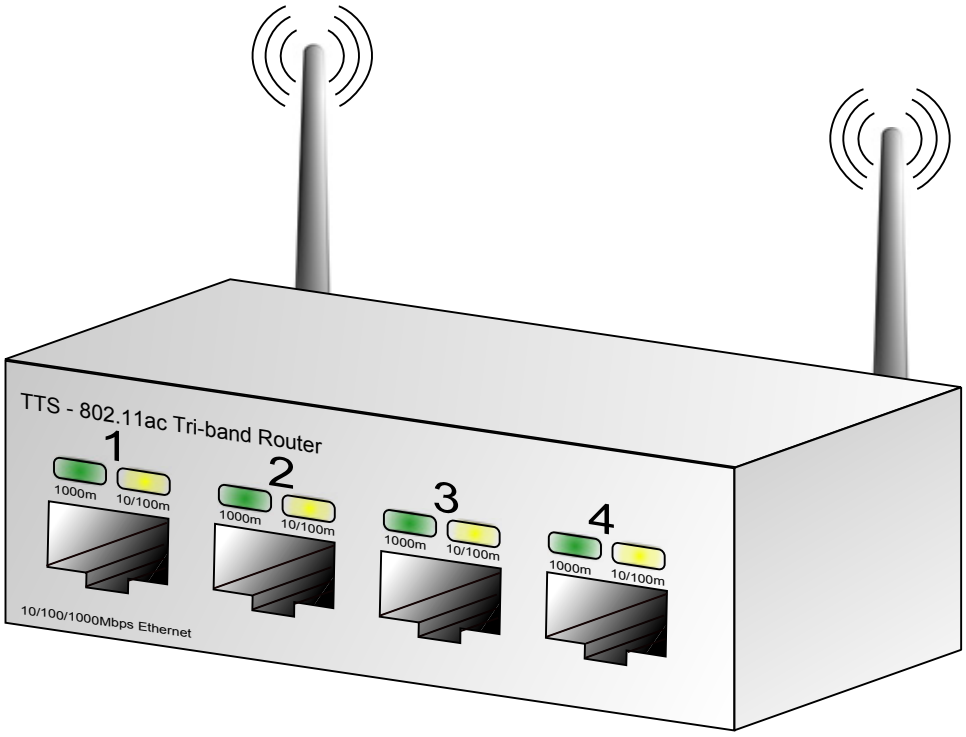

The Panel is skewed correctly – (no longer Horizontal and not distorted)	1
The components are skewed consistently with the panel	1
The top panel is inserted as a whole **filled** quadrilateral	1
The top panel fits and the proportion matches the image in the question paper	1
The side panel is inserted as a whole **filled** quadrilateral **…**	1
The side panel fits with panel and top	1
The 1st antenna is added as a **gradient filled** solid ***single shape***	1
The antenna **tapers** and has a **rounded top**	1
The antenna appears to be curved	1
There are 3 smooth curved waves – in the correct position	1
The waves are equally spaced	1
The proportions and position of the 1st antenna and waves are correct	1
The antenna (and waves) is **Duplicated** and in an equivalent position	1
There is a **Gradient fill** to all the sockets	1
The gradient is **White to black** – **left to right**	1
Parallel*(ish)* lines are added and positioned in all sockets	1
All the lines are accurate and consistent	1
The image is saved as **Router** in **SVG format**	1

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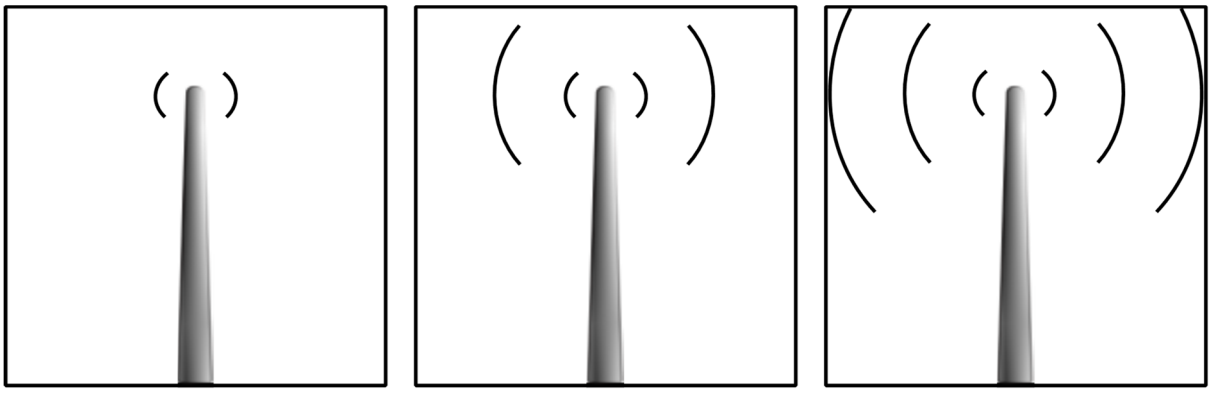
Task 4



The antenna from the Router image used *(or the image matches the image shown in the question paper)*	1
The proportions of the antenna are maintained	1
3 consistent waves develop as shown in the question paper**...**	1
3 Smooth curves are all visible together at some point	1
Each curve **grows** smoothly **...**	1
The curve shapes are maintained during the animation	1
Each curve takes 1 sec to grow before disappearing	1
The animation is smooth, stable and does not flicker	1
The animation loops	1
The animation is saved as a GIF file with a frame size (*Dimension*) of 250 $\times$ 250	1

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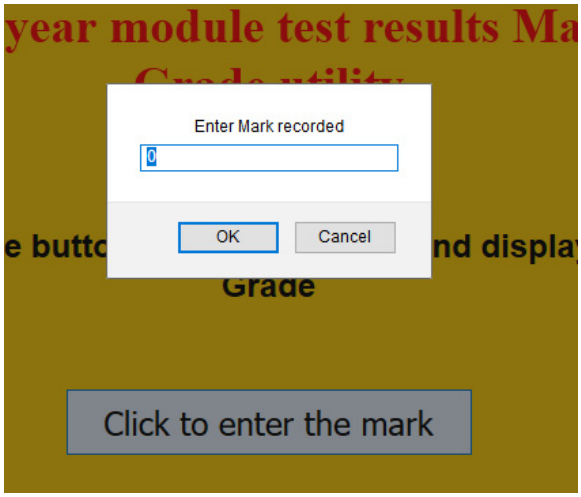
Task 5



A mouse click on the button produces the prompt dialog	1
Suitable prompt text is used	1
The results are tested for these values	
87=A, 86=B	1
65=B, 64=C	1
37=C, 36=F	1
abs=F	1

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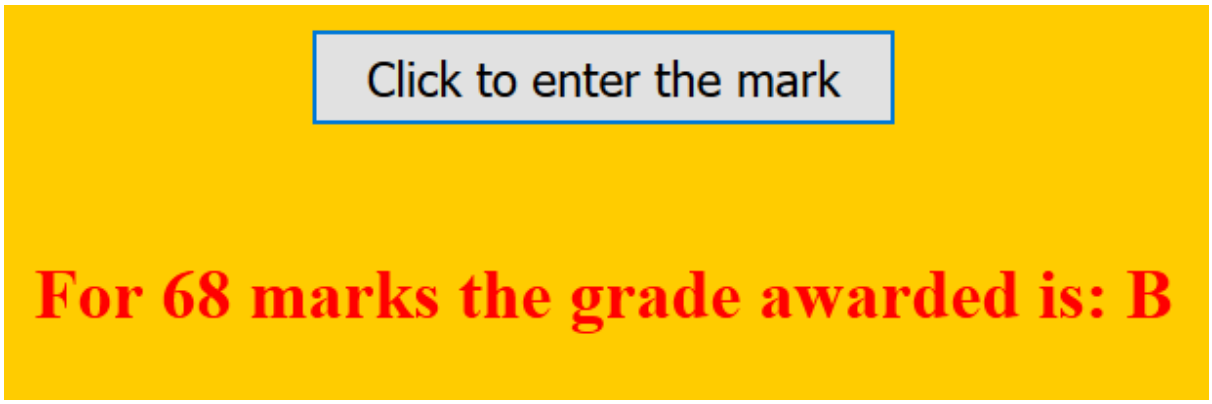

The correct output is seen on the page **For ...Marks the grade awarded is:**	1
All the text is displayed in a consistent font and size. *The grade is in capitals*	1
The mark, the grade and all the text is concatenated and spaced correctly	1

Example script

```
<script>

function ConvertMark() {
var Mark = prompt ("Enter Mark recorded", 0)
    var grade;
    if       (Mark > 86)
             {grade = "A";}
    else if (Mark > 64)
             {grade = "B";}
    else if (Mark >36)
             {grade = "C";}
    else     {grade="F";}

document.getElementById("display grade here").innerHTML = "For "+Mark+" marks "+"the grade awarded is: "+grade;
}
</script>
```

```
if       (Mark > 86)    {grade = "A";}
else if  (Mark > 64)    {grade = "B";}
else if  (Mark >36)     {grade = "C";}
else     {grade="F";}
```

Script tags are added and are complete within the head or body	1
A **function** is inserted	1
The function is named **ConvertMark()**	1
Variable(s) are created	1
The code **document.getElementById("display grade here")** is used	1
if, else if, Switch *or equivalent code* is used	1