

Designing meaningful objective assessments for technology enabled evaluation.

Meaningful objective assessments can be designed using MKCL’s Online Evaluation System (OES).

Questions can be designed to assess learning objectives at different levels. With specific reference to Bloom’s Taxonomy (*Original or Revised*), the learning objectives can be assessed at six levels viz: *Knowledge/ Remember, Comprehension/ Understand, Application, Analysis, Synthesis and Evaluation/ Creation*. These can be grouped and categorized into difficulty levels such as low, medium and high. Further, various question types along with different media types such as text, audio, video, image can be used.

While designing questions using MKCL’s OES, such attributes of a question mentioned above are stored in the question repository for each and every question, i.e. assessment item. Based on these attributes, the system generates personalized data about attainment of specific learning objective for every student appearing for the exam.

Detailed description of what type of questions can be designed for technology enabled evaluation is furnished herewith.

Attributes of a question:

1. Ability
2. Bloom’s Taxonomy level
3. Learning Objective
4. Subject – Unit – Chapter
5. Difficulty level
6. Type of a question

Bloom’s Taxonomy Levels and objectives for assessment:

- 1. Knowledge**
 - a. Knowledge of specifics: Knowledge of terminology, Fact
 - b. Knowledge of ways and means of dealing with specifics: Knowledge of conventions, trends and sequences, classifications and categories, criteria, methodology
 - c. Knowledge of universals and abstractions in a field: Knowledge of principles and generalizations, theories and structures
- 2. Comprehension**
 - a. Translation
 - b. Interpretation
 - c. Extrapolation
- 3. Application**
- 4. Analysis**
 - a. Analysis of elements
 - b. Analysis of principles
 - c. Analysis of organizational elements
- 5. Synthesis**

- a. Production of a unique communication
- b. Production of a plan, or proposed set of operations
- c. Derivation of a set of abstract relations

6. Evaluation

- a. Evaluation in terms of internal evidence
- b. Judgments in terms of external criteria

Question designing strategies for using these question types:

1. Definition of learning objective
2. Selection of question type based on available media and level of learning objective
3. Designing not-so obvious options
4. Designing incorrect options as conceptual distractors
5. Designing questions for more than one levels of learning objectives, i.e. few questions may cut across levels and fall in both the levels such as knowledge and comprehension

Following are the basic guidelines to create a question bank for Online examination conduction through MKCL's Online Evaluation System.

Qualitative Guidelines:

Following are the details present in the import template. The subject wise template can be downloaded from the question bank creator (item bank) login.

1. Difficulty Level
2. Author (it's optional)
3. No. of Options in the Questions
4. Question text (without any special character, image, formula, subscript or superscript as they are to be created in image form as per guidelines given below)
5. Option wise Text
6. Correct Option No.

Guidelines for Question Bank Creation – MKCL OES

1. Fill Difficulty Level of the question. The difficulty level should be in number 1,2,3 for low, Medium & High simultaneously.

Input Language	English	English	English									
Item Bank ID	15271	Item Bank Name	IT for Teacher									
Difficulty Level (Low-1,Medium-2,High-3)	Author	Expiry Date (dd/mm/yy)	No. of Options(2-6)	Question Text	Item Image	Backward Linkage	Forward Linkage	Reference	Feedback Correct	Feedback Incorrect	Instructions	
1			4	Special effects used to introduce slides in a presentation are known as?								
1			4	The default view in Google Calendar is the _____ view.								
1			4	Why is there no Save button for your files in Google Drive?								
1			4	This is not the sign of engaged student								
2			4	In Google Slides, the overall design of all the slides is called the _____								
1			4	You will need a minimum of how many pictures to create an album in Google Photos?								
1			4	What is the best way to open Google Keep?								
3			4	What icon allows you to work on a Google Keep note with another person?								

Fill Difficulty Level

Figure 1. Difficulty Level in OES Template

2. Create Multiple Choice Single Correct questions having 4 options (Max 6 options)

Input Language	English	English	English									
Item Bank ID	15271	Item Bank Name	IT for Teacher									
Difficulty Level (Low-1,Medium-2,High-3)	Author	Expiry Date (dd/mm/yy)	No. of Options(2-6)	Question Text	Item Image	Backward Linkage	Forward Linkage	Reference	Feedback Correct	Feedback Incorrect	Instructions	
1			4	Special effects used to introduce slides in a presentation are known as?								
1			4	The default view in Google Calendar is the _____ view.								
1			4	Why is there no Save button for your files in Google Drive?								
1			4	This is not the sign of engaged student								
2			4	In Google Slides, the overall design of all the slides is called the _____								
1			4	You will need a minimum of how many pictures to create an album in Google Photos?								
1			4	What is the best way to open Google Keep?								
3			4	What icon allows you to work on a Google Keep note with another person?								

Fill No. of Option

Figure 2. MCQ Questions with 4 Options

Guidelines for Question Bank Creation – MKCL OES

3. Enter the Question text in the Column.

Input Language	English	English																					
Item Bank ID	15271	Item Bank Name		IP for Teacher		Item Image		Backward Linkage		Forward Linkage		Reference		Feedback Correct		Feedback Incorrect		Instructions					
Difficulty Level (Low-1, Medium-2, High-3)		Author		Expiry Date (dd/mm/yy)		No. of Options (2-6)		Question Text		Item Image		Backward Linkage		Forward Linkage		Reference		Feedback Correct		Feedback Incorrect		Instructions	
1					4		Special effects used to introduce slides in a presentation are known as?																
1					4		The default view in Google Calendar is the _____ view.																
1					4		Why is there no Save button for your files in Google Drive?																
1					4		This is not the sign of engaged student in Google Slides, the overall design of all the slides is called the _____.																
2					4		You will need a minimum of how many pictures to create an album in Google Photos?																
1					4		What is the best way to open Google Keep?																
1					4		What icon allows you to work on a Google Keep note with another person?																
3					4																		

Fill the column with Question text

Figure 3. Question Text in OES Template

4. The questions should follow principle of “Conceptual Distraction”. It means all four options must look correct unless the concept is absolutely clear.

Consider the following equation

$$\square \times 4 = \square \times 8 \div 2$$

Which value of \square makes the equation true?

- a) Only 1
- b) Only 10
- c) Either 1 or 10
- d) Any number

Figure 4. Example for Conceptual Distractor Options in Question

Guidelines for Question Bank Creation – MKCL OES

5. Fill the Option text in the Option Text 1,2,3,4 columns. If the questions in having only 2 options then option text 3,4,5,6 columns should be empty. Do not fill the cells with space, “_” or any special character.

Option Text 1	Option Image 1	Reference for Option 1	Justification for Option 1	Justification Image for Option 1	Option Text 2	Option Image 2	Reference for Option 2	Justification for Option 2	Justification Image for Option 2
transitions					effects				
Hourly					Weekly				
No changes are ever saved.					Google Drive uses autosave, which automatically and immediately				
Taking notes					Asking questions				
Layout					Theme				
4					1				
URL					Google Menu				
Share					Collaborator				

Fill Option 1 Text

Fill Option 2 Text

Figure 5. Filling the Option Texts for Option 1 & 2

Option Text 3	Option Image 3	Reference for Option 3	Justification for Option 3	Justification Image for Option 3	Option Text 4	Option Image 4	Reference for Option 4	Justification for Option 4	Justification Image for Option 4
custom animations					annotations				
Monthly					Daily				
The Save button is in the “File” submenu.					You “Right-Click” to get the Save function.				
Chatting					Responding to questions				
Format					Presentation Play				
15					2				
File Menu					Google it				
Color Change					Archive				

Fill Option 3 Text

Fill Option 4 Text

Figure 6. Filling the Option Texts for Option 3 & 4

Guidelines for Question Bank Creation – MKCL OES

Option Text 5	Option Image 5	Reference for Option 5	Justification for Option 5	Justification Image for Option 5	Option Text 6	Option Image 6	Reference for Option 6	Justification for Option 6	Justification Image for Option 6	Correct Option
										1
										2
										2
										2
										2
										2
										2
										2
										2
										2

Option 5 & 6 are kept empty as these questions is having only 4 options

Figure 7. Blank Option for Option 5 & 6

- Avoid options stating “None of the Above” and “All of the Above”. If option randomisation is used in the exam then these options will be confusing if they come first in the option sequence.

Option Text 3	Option Image 3	Reference for Option 3	Justification for Option 3	Justification Image for Option 3	Option Text 4	Option Image 4	Reference for Option 4	Justification for Option 4	Justification Image for Option 4
custom animations					annotations				
Monthly					Daily				
The Save button is in the “File” submenu.					You “Right-Click” to get the Save function.				
Chatting					Responding to questions				
Format					Presentation Plan				
15					All of the Above				
File Menu					Logout				
Color Change					None of the Above				

Avoid using All/None of the Above as Option

Figure 8. Avoid these Option

- Correct Option must be filled with correct option number. Please ensure that correct option number should be entered and not the option text. This field should not contain any text or should be blank.

Option Text 5	Option Image 5	Reference for Option 5	Justification for Option	Justification Image for Option 5	Option Text 6	Option Image 6	Reference for Option 6	Justification for Option	Justification Image for Option 6	Correct Option
										1
										2
										2
										2
										2
										2
										2
										2

Enter the Correct Option Number in this column

Figure 9. Example for Conceptual Distractor Options in Question

8. A proper hierarchy of the syllabus on whom questions are to be made is to be created first. Generally it goes like, Standard-Subject-Unit-Chapter-Topic. You may skip any node as per your syllabus, but try to segregate the questions based on lowest possible node (over here its topic).

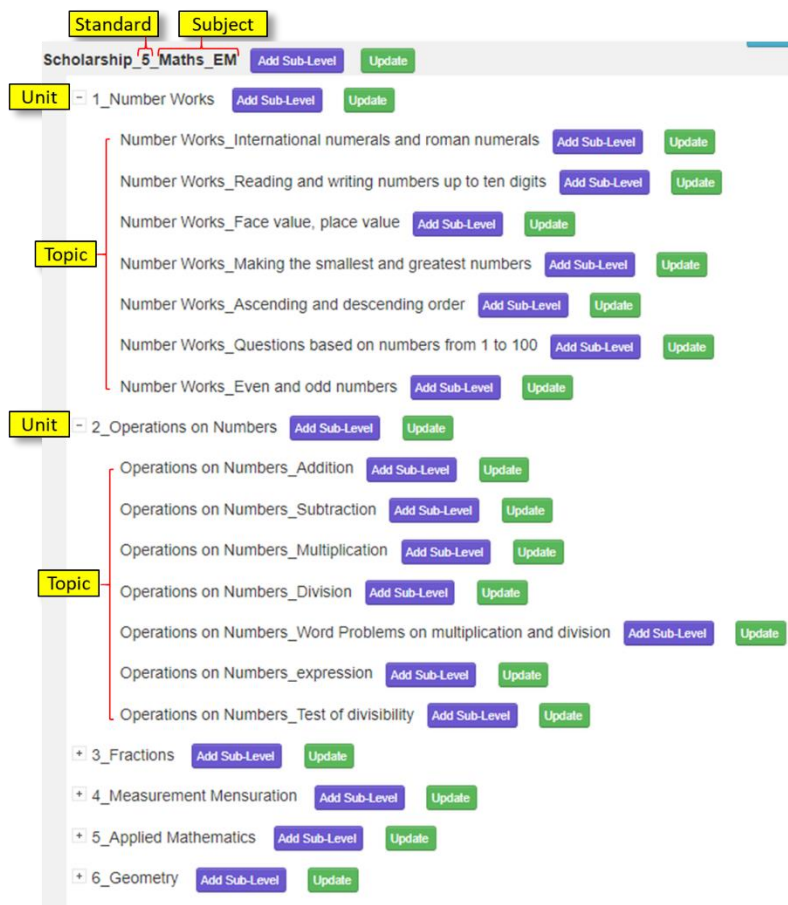


Figure 10. Question Bank Hierarchy

Technical Guidelines:

The question sample attached is of the question type Multiple Choice Single Correct, wherein the questions can be in the form of Images or text. The samples as well as the templates provided will guide you in creating the question bank. Also some of the basic instructions are given below, please follow them while creating the question bank.

Some basic Instructions-

For textual type questions:

1. Type the questions in the excel file directly. Copy paste from other file is also possible, but utmost care should be taken to ensure the format of the text as numbers and date formatting does not change after copy paste.

Guidelines for Question Bank Creation – MKCL OES

2. Use separate excel (.xlsx) files for different topics.

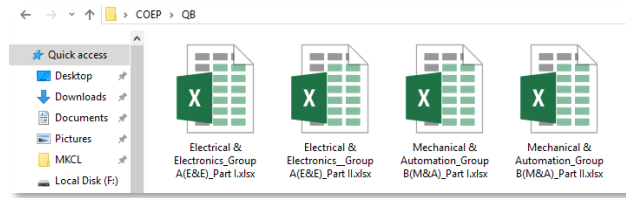
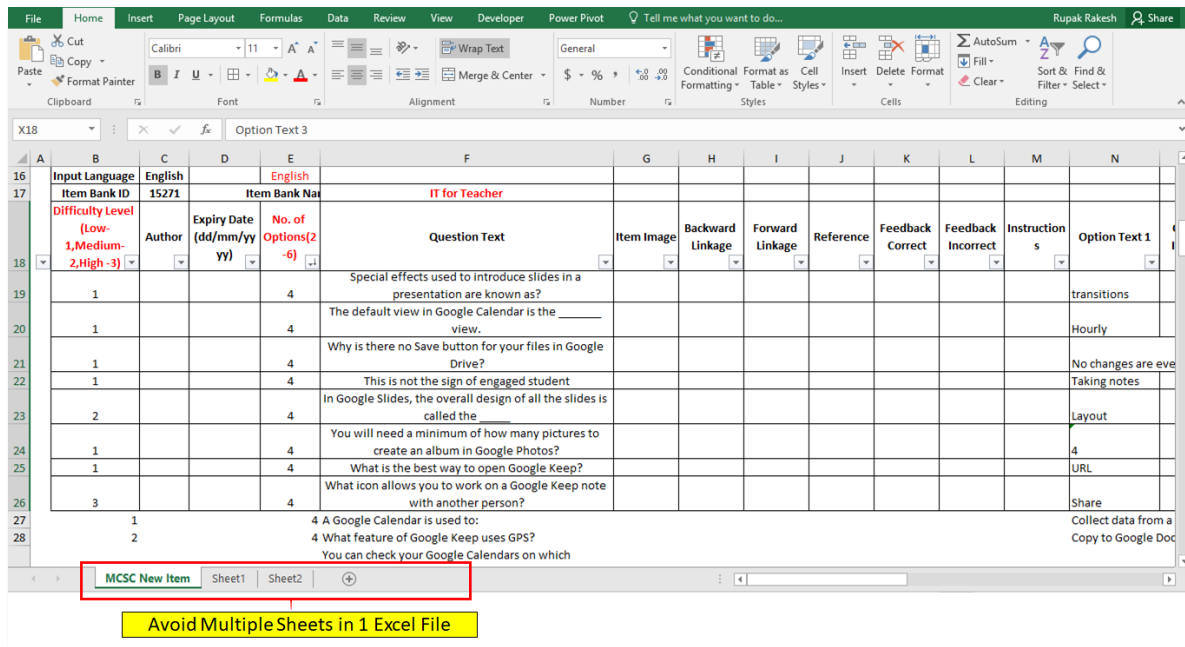


Figure 11. Topic wise QB excels files (.xlsx)

3. Do not create multiple sheets in a single Excel file.



Input Language	English	English	English	IT for Teacher									
Item Bank ID	15271	Item Bank Name		Question Text	Item Image	Backward Linkage	Forward Linkage	Reference	Feedback Correct	Feedback Incorrect	Instructions	Option Text 1	
Difficulty Level (Low-1, Medium-2, High-3)		Author	Expiry Date (dd/mm/yy)	No. of Options(2-6)									
1				4	Special effects used to introduce slides in a presentation are known as?							transitions	
1				4	The default view in Google Calendar is the _____ view.							Hourly	
1				4	Why is there no Save button for your files in Google Drive?							No changes are eve	
1				4	This is not the sign of engaged student							Taking notes	
2				4	In Google Slides, the overall design of all the slides is called the _____							Layout	
1				4	You will need a minimum of how many pictures to create an album in Google Photos?							4	
1				4	What is the best way to open Google Keep?							URL	
3				4	What icon allows you to work on a Google Keep note with another person?							Share	
1				4	A Google Calendar is used to:							Collect data from a	
2				4	What feature of Google Keep uses GPS?							Copy to Google Doc	
					You can check your Google Calendars on which								

Figure 12. Avoid Multiple Sheets in 1 Excel

- Do not add special characters, images, symbols, formula, subscript or superscript in the Question text or Option text.

Avoid

Superscript: $x^2 + y^2 = z^2$	Subscript: $C_6H_{12}O_6$	Formula: $x^3 - 5$ $(7x - 4)^3 - 5$
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Figure 13. Avoid in Question/Option Text

- If you come across such type of questions/options then, please add those in Picture Type questions.
- Questions where underlined or **bold** or *italics* text is present should be included in Picture Type questions only.

Avoid

Find the meaning of the underlined word(s).
When he was challenged, the salesman stood up for his product.

Find the meaning of the Highlighted word(s).
This book is about a man who **deserted** his family and went to live in the Himalayas.

Figure 14. Avoid Bold/Underline words in Question Text

- As we provide multilingual support for following languages: English, Hindi, Marathi the questions should be provided only in **Unicode** font only. (If bilingual questions bank is to be created, please contact MKCL for further assistance)

For Image type questions:

- Create the complete question bank in MS-Word only for the questions which have figures, diagrams, chemical equations, special symbols or characters, subscript or superscript as a part of the question or Option. Font size should be minimum 12 and maximum 14.

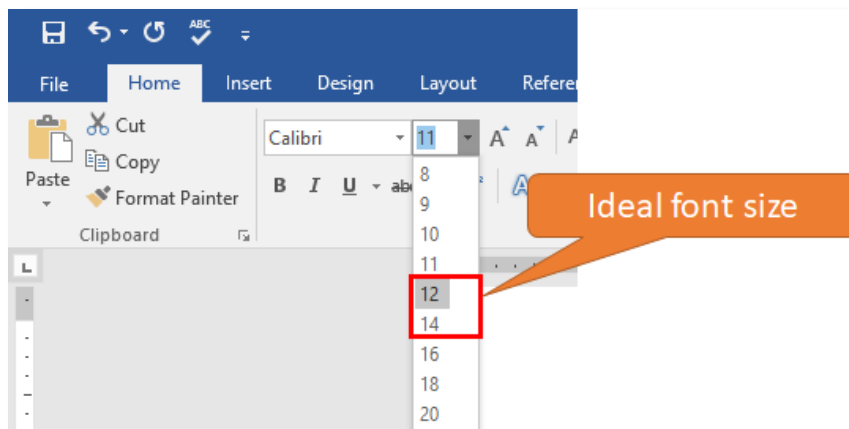


Figure 15. Font Size for Question & Option Text

2. Create images of the word file by Print Screen option, crop them with the help of any image editor utility and save the files in .jpg format as per the samples attached. E.g. **q1.jpg, q1o1.jpg, q1o2.jpg, q1o3.jpg, q1o4.jpg.**

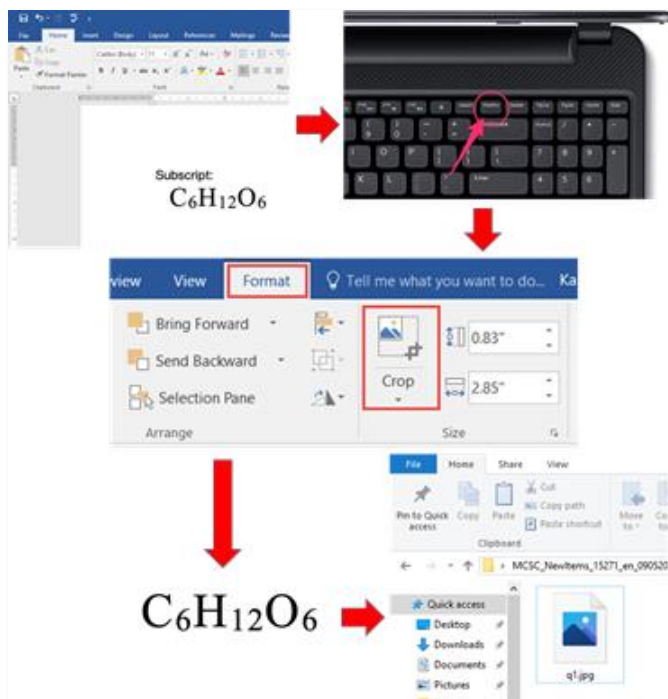


Figure 16. Use Print Screen to create Image based question

3. Please ensure the image resolutions should be not more than: horizontal – 700 pixels: vertical – 300 pixels

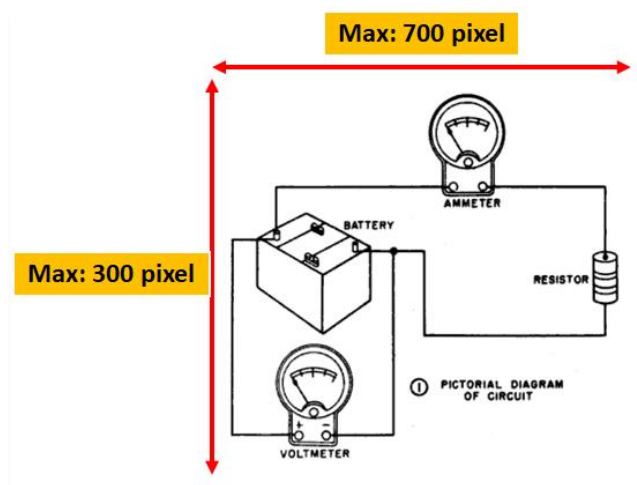


Figure 17. Image Dimensions for Question/Option

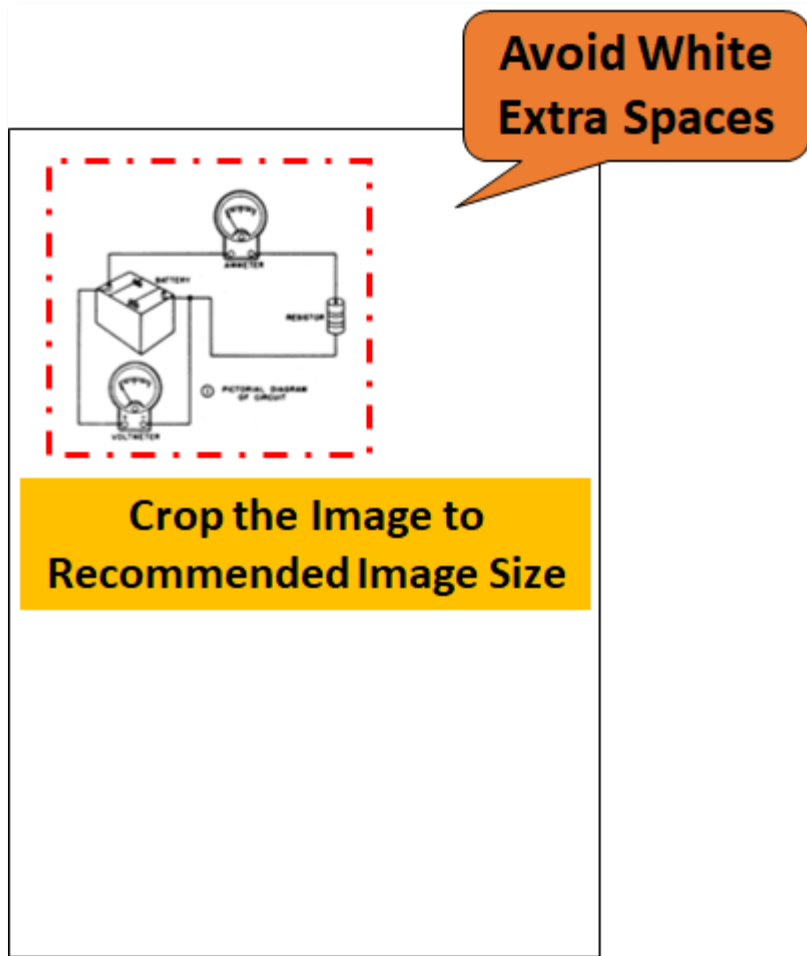


Figure 18. Tips for Cropping Image

4. You can then write the name of the image in excel in the image column(the image names should be in small case and avoid any kind of special characters and spaces in the image names)

	A	B	C	D	E	F	G	H	I	J	K	L	M
16		Input Language	English		English								
17		Item Bank ID	15271		Item Bank Name	IT for Teacher							
		Difficulty Level		Expiry Date	No. of	Question Text	Item Image	Backward	Forward	Reference	Feedback	Feedback	Instructions
		(Low-1,Medium-2,High-3)	Author	(dd/mm/yy)	Options(2-6)			Linkage	Linkage		Correct	Incorrect	
18						Special effects used to introduce slides in a presentation are known as?	q1.jpg						
19		1			4	The default view in Google Calendar is the _____ view.							
20		1			4	Why is there no Save button for your files in Google Drive?							
21		1			4	This is not the sign of engaged student							
22		1			4	In Google Slides, the overall design of all the slides is called the _____							
23		2			4	You will need a minimum of how many pictures to create an album in Google Photos?							
24		1			4	What is the best way to open Google Keep?							
25		1			4	What icon allows you to work on a Google Keep note with another person?							
26		3			4								

Figure 19. Image name in Item Image Column

Guidelines for Question Bank Creation – MKCL OES

5. Create separate folders for each topic or subject.
6. To reduce the size of the images you can use any of the freely available image compression software. E.g. IrfanView

OES Template Validator:

Once the excel file is ready in the prescribed OES format. The file can be validated using OES - MCSC Checker -v 1.1. Following is the step to follow:

Download the file from the following link:

<https://fileshare.mkcl.org/index.php/s/KAkq3wPbf8wyeiy>

Step 1: Open the file “OES - MCSC Checker -v 1.1.xlsm”

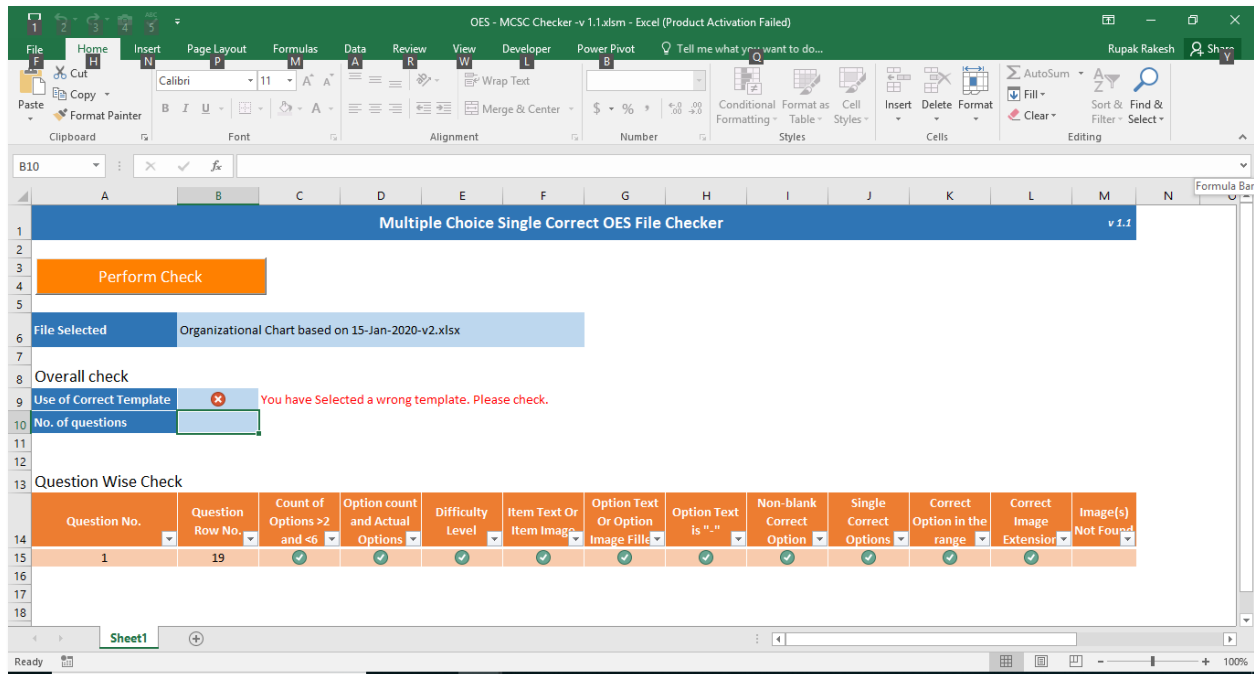


Figure 20. OES Excel File Validator

Step 2: Click on “Perform Check” button.

Guidelines for Question Bank Creation – MKCL OES

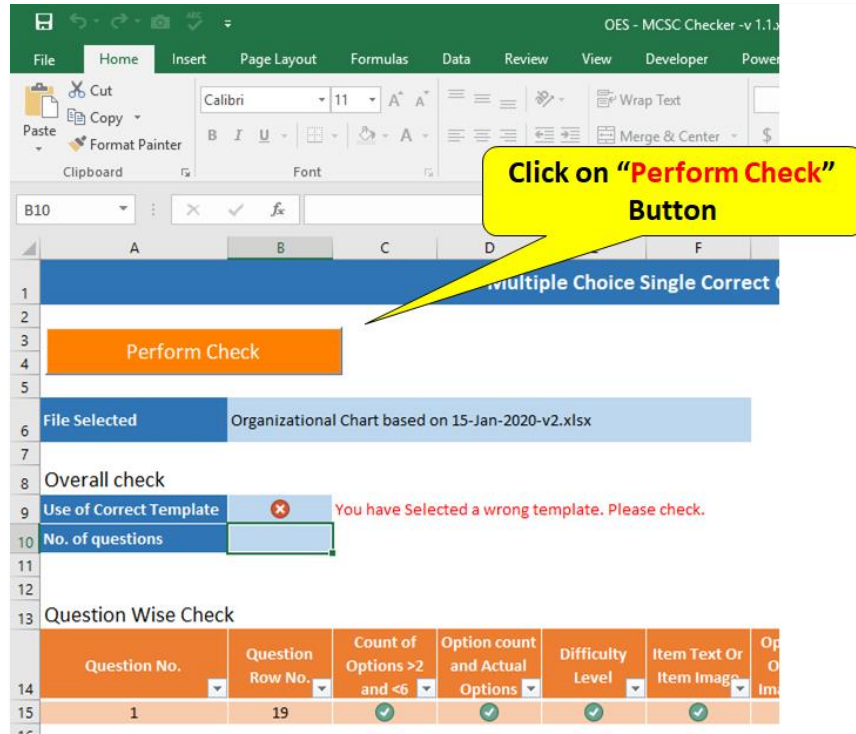


Figure 21. Step 2 - Template Validator

Step 3: Browse & Select the Question excel file prepared by you.

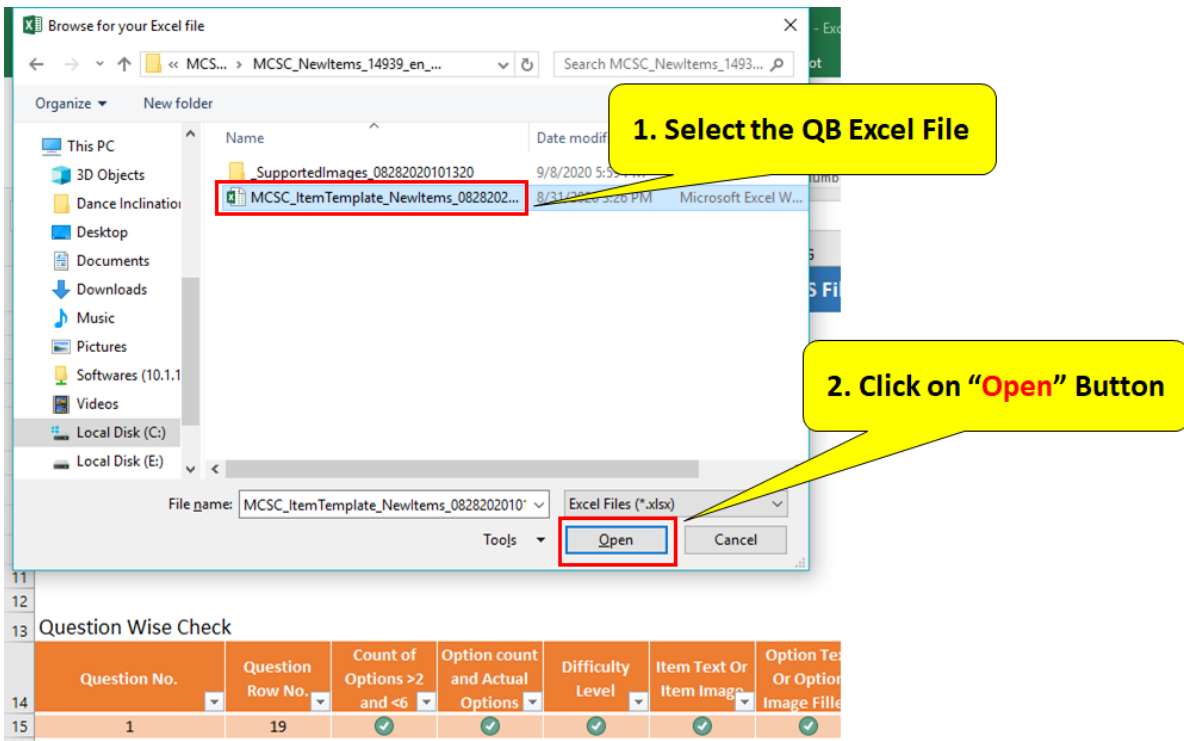


Figure 22. Step 3 - Browse & Select the QB Excel

Guidelines for Question Bank Creation – MKCL OES

Step 4: Read the Feedback. “x” indicates, the issue in the question number.

Figure 23. Step 4 - Check the Issues

Question No.	Question Row No.	Count of Options >2 and <6	Option count and Actual Options	Difficulty Level	Item Text Or Item Image	Option Text Or Option Image File	Option Text is ".-	Non-blank Correct Option	Single Correct Options	Correct Option in the range	Correct Image Extension	Image(s) Not Found
1	19	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2	20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	Item
3	21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	Option2

This indicates that the question is not having correct extension or the image file name is missing in the image column in question or option

Figure 24. Step 4 - Feedback 1

Question No.	Question Row No.	Count of Options >2 and <6	Option count and Actual Options	Difficulty Level	Item Text Or Item Image	Option Text Or Option Image File	Option Text is ".-	Non-blank Correct Option	Single Correct Options	Correct Option in the range	Correct Image Extension	Image(s) Not Found
1	19	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2	20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	Item
3	21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	Option2
4	22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
5	23	✗	✗	✓	✓	✓	✓	✓	✓	✗	✓	
6	24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

This indicates:
1. "No. of Option" cell is blank or
2. "No. of Option" cell is having value <2 or >6

Figure 25. Step 4 - Feedback 2

So make the necessary changes in Original excel file as per the feedback provided by the OES Template Validator. Once all the questions are validated the excel file is ready to be uploaded in OES.

Sample user interface of the question screen appeared to the candidate.

Multiple Choice Single Correct

MKCL OES Online Evaluation System AllMixPaper2

Time Remaining 09:25

User: .devendrach

Number of questions : 2

0 Answered 2 Not Answered

0 For Review 0 Not Visited

1 2

View QP Profile

Instructions End Test

Question No. 1

which of the following is the last step in aerobic respiration in which water is formed and energy is released ?

Options:

- Glycolysis
- Acetylation
- Krebs cycle
- Electron transfer

Save & Next Mark for Review Skip Reset

Multiple Choice Single Correct with image in question

MKCL OES Online Evaluation System General Science Practice Test

Total questions in exam: 25 | Answered: 0

Time Remaining 58:24

User: msubdev16

Number of main questions : 21

Number of questions : 25

0 Answered 11 Not Answered

10 Not Visited 0 Partially Answered

1 2 3 4 5 6 7

8 9 10 11 12 13 14

15 16 17 18 19 20 21

Profile Instructions

End Test

Question No. 11

What does the given images show?

Options:

- DC Generator
- AC Generator
- Alternator
- None of the option

Save & Next