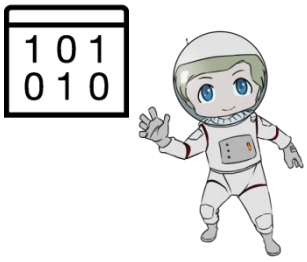


Informatics, Space, Innovation

(Grade 12, Questions/Answers)

All time values in Book of Problems are indicated as UTC (Coordinated Universal Time)

Grade 12

Grade 12

Telescope	Asteroide	Mass	Roscosmos	Velocity	Astronomy	STEM
Astronaut	Meteorite	Gravity	JAXA	Time	Geography	
Robot	Earth	Atmosphere	CNSA	Trajectory	Mathematics	
Rocket	Moon	Frequency	ISRO	Orbit	Physics	
Shuttle	Mars	Radiation	CNES	Distance	Chemistry	
ISS	Planet	Wave	DLR	Velocity	Biology	
Cubesat	Sun	Magnetism	CNES	Time	Astronomy	
Satellite	Comet	Temperature	DLR	Period	Geography	
Rover	Planet	Mass	NASA	Angle	Mathematics	
Probe	Sun	Gravity	ESA	Coordinate	Physics	

I-12.1 – **Problem No. 41**





Telescope	Asteroide	Mass	Roscosmos	Velocity	Astronomy

Write short ***real space story*** dealing with topics presented in the above coloured cells.

Insert ***open source picture*** in the right side of the text.

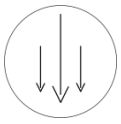
For more information visit this webpage. *(Fill in corresponding hyperlink)*.

Question (A):

Write the text of question in bold font.

I-12.2 – **Problem No. 42**






Astronaut	Meteorite	Gravity	JAXA	Time	Geography

Write short ***real space story*** dealing with topics presented in the above coloured cells.

Insert ***open source picture*** in the left side of the text.

For more information visit this webpage. *(Fill in corresponding hyperlink)*.

Question (A):

Write the text of question in bold font.

I-12.3 – **Problem No. 43**





Robot	Earth	Atmosphere	CNSA	Trajectory	Mathematics

Write short ***real space story*** dealing with topics presented in the above coloured cells.

Insert ***open source picture*** in the right side of the text.

For more information visit this webpage. *(Fill in corresponding hyperlink)*.

Question (A):

Write the text of question in bold font.

I-12.4 – **Problem No. 44**





Rocket	Moon	Frequency	ISRO	Orbit	Physics

Write short ***real space story*** dealing with topics presented in the above coloured cells.

Insert ***open source picture*** in the left side of the text.

For more information visit this webpage. *(Fill in corresponding hyperlink)*.

Question (A):

Write the text of question in bold font.

I-12.5 – **Problem No. 45**





Shuttle	Mars	Radiation	CNES	Distance	Chemistry

Write short ***real space story*** dealing with topics presented in the above coloured cells.

Insert ***open source picture*** in the right side of the text.

For more information visit this webpage. *(Fill in corresponding hyperlink)*.

Question (A):

Write the text of question in bold font.

I-12.6 – **Problem No. 46**





ISS	Planet	Wave	DLR	Velocity	Biology

Write short ***real space story*** dealing with topics presented in the above coloured cells.

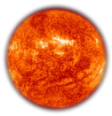
Insert ***open source picture*** in the left side of the text.

For more information visit this webpage. *(Fill in corresponding hyperlink)*.

Question (A):

Write the text of question in bold font.

I-12.7 – **Problem No. 47**



Cubesat	Sun	Magnetism	CNES	Time	Astronomy

Write short ***real space story*** dealing with topics presented in the above coloured cells.

Insert ***open source picture*** in the right side of the text.

For more information visit this webpage. *(Fill in corresponding hyperlink)*.

Question (A):

Write the text of question in bold font.

I-12.8 – **Problem No. 48**





Satellite	Comet	Temperature	DLR	Period	Geography

Write short ***real space story*** dealing with topics presented in the above coloured cells.

Insert ***open source picture*** in the left side of the text.

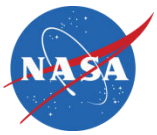
For more information visit this webpage. *(Fill in corresponding hyperlink)*.

Question (A):

Write the text of question in bold font.

I-12.9 – **Problem No. 49**



Rover	Planet	Mass	NASA	Angle	Mathematics

Write short ***real space story*** dealing with topics presented in the above coloured cells.

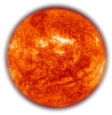
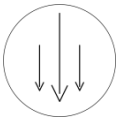
Insert ***open source picture*** in the right side of the text.

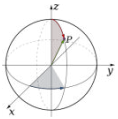
For more information visit this webpage. *(Fill in corresponding hyperlink)*.

Question (A):

Write the text of question in bold font.

I-12.10 – **Problem No. 50**




Probe	Sun	Gravity	ESA	Coordinate	Physics

Write short ***real space story*** dealing with topics presented in the above coloured cells.

Insert ***open source picture*** in the left side of the text.

For more information visit this webpage. *(Fill in corresponding hyperlink)*.

Question (A):

Write the text of question in bold font.

Space calendar http://www.spacecalendar.com http://spaceflightnow.com/launch-schedule/

February 18 (YEAR)
http://www.astronautix.com/f/february18.html
Write very brief message about space-related event of this day in history, specify a year.

February 20 (YEAR)
http://www.astronautix.com/f/february20.html
Write very brief message about space-related event of this day in history, specify a year.

April 10 (YEAR)
http://www.astronautix.com/a/april10.html
Write very brief message about space-related event of this day in history, specify a year.

April 12 (1961)
http://www.astronautix.com/a/april12.html
https://en.wikipedia.org/wiki/Yuri_Gagarin
First ever human flight in space.

June 3 (YEAR)
http://www.astronautix.com/j/june03.html
Write very brief message about space-related event of this day in history, specify a year.

June 9 (YEAR)
http://www.astronautix.com/j/june09.html
Write very brief message about space-related event of this day in history, specify a year.

July 25 (YEAR)
http://www.astronautix.com/j/july25.html
Write very brief message about space-related event of this day in history, specify a year.

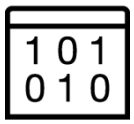
September 15 (YEAR)
http://www.astronautix.com/s/september15.html
Write very brief message about space-related event of this day in history, specify a year.

November 6 (YEAR)
http://www.astronautix.com/n/november06.html
Write very brief message about space-related event of this day in history, specify a year.

December 28 (YEAR)
http://www.astronautix.com/d/december28.html
Write very brief message about space-related event of this day in history, specify a year.

December 30 (YEAR)
http://www.astronautix.com/d/december30.html
Write very brief message about space-related event of this day in history, specify a year.

ANSWERS



Grade 12

B-12.1 (Q) Return to Content

Problem solution comment.

Answer: write in the answer.

B-12.2 (Q) Return to Content

Problem solution comment.

Answer: write in the answer.

B-12.3 (Q) Return to Content

Problem solution comment.

Answer: write in the answer.

B-12.4 (Q) Return to Content

Problem solution comment.

Answer: write in the answer.

B-12.5 (Q) Return to Content

Problem solution comment.

Answer: write in the answer.

B-12.6 (Q) Return to Content

Problem solution comment.

Answer: write in the answer.

B-12.7 (Q) Return to Content

Problem solution comment.

Answer: write in the answer.

B-12.8 (Q) Return to Content

Problem solution comment.

Answer: write in the answer.

B-12.9 (Q) Return to Content

Problem solution comment.

Answer: write in the answer.

B-12.10 (Q) Return to Content

Problem solution comment.

Answer: write in the answer.

INFORMATION SOURCE

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ESA - http://www.esa.int/ESA/Our_Missions

NASA - https://www.nasa.gov/missions

DLR - http://www.dlr.de/dlr/en/desktopdefault.aspx/tabid-10012/#/Missionen/Start/Feature

JAXA - http://global.jaxa.jp/projects/

CNSA - http://www.cnsa.gov.cn/n6443408/index.html

CNES - https://cnes.fr/en/fiches_mission_alpha

ISRO - http://www.isro.gov.in/missions-0

Roscosmos - http://en.roscosmos.ru/

http://hpde.gsfc.nasa.gov/Borne_Informatics.ppt
http://serc.carleton.edu/usingdata/index.html
http://d32ogoqmya1dw8.cloudfront.net/files/usingdata/UsingData.pdf
http://www.dlese.org/library/index.jsp

http://www.nasa.gov/audience/foreducators/stem-on-station/lessons
http://www.nasa.gov/audience/foreducators/k-4/features/materials_archive_1.html
http://mynasadata.larc.nasa.gov/educators/

Information on Launch vehicles, Satellites, Space Shuttle and Astronautics:

http://space.skyrocket.de/index.html

VOCABULARY

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Telescope
Earth or Space based instrument for observation of remote objects.

Astronaut
Person trained for human spaceflight (as well cosmonaut or taikonaut).

Robot
Mechanical aparatus capable to perform programmed physical tasks in space.

Rocket
Flying space device powered by the reactive force.

Shuttle
Reusable spaceplane for Earth orbiting or human/cargo delivery to ISS.

ISS
Earth‘s largest artificial satellite - International Space Station.

Cubesat
Earth‘s artificial cube shaped satellite, dimensions 10×10×10 cm, mass – 1 kg.

Satellite
Artificial object launched by human efforts and orbiting any space body.

Rover
Vehicle designed to explore surface of any space body.

Probe
Automatic spacecraft exploring bodies of Solar system.

Earth
Third planet from the Sun and fifth largest planet of Solar system.

Moon
Earth‘s natural satellite.

Mars
Fourth planet from the Sun and seventh largest planet of Solar system.

Planet
Space body revolving around a star (including the Sun).

Sun
Earth‘s closest star.

Comet
Small icy space body (cometoid), when passing close to the Sun displaying coma or tail.

Asteroide
Minor planet (planetoid) orbiting the Sun in elliptical orbit.

Meteorite
Debris from space object (meteoroid) survived the passage through atmosphere.

Temperature
Object‘s (space body) warmth.

Mass
Quantity of matter.

Gravity
Interaction between material bodies depending on their mass.

Atmosphere
Gas layer surrounding space body of sufficient mass.

Frequency
Event recurrence per unit of time.

Radiation
Spontaneous decay of atomic nuclei.

Wave
Energy transfer in space and time.

Magnetism
Magnetic interaction occuring between the moving electric charges.

NASA
National Aeronautics and Space Administration – governmental agency of USA.

ESA
European Space Agency – intergovernmental space exploration organisation.

Roscosmos
Roscosmos State Corporation for Space Activities – governmental body of Russia.

JAXA
Japan‘s National Aero-space Agency - national agency of Japan.

CNSA
China National Space Administration - national agency of China.

ISRO
Indian Space research Organisation – governmental agency of India.

CNES
National Center of Space Research - governmental agency of France.

DLR
German Aerospace Center – national center of Germany.

Time
Duration of object (space body) existence.

Period

Time elapsed for one rotation of object (space body) around its axis or other space body.

Angle

Figure (area) formed by two rays sharing the common endpoint.

Coordinate

Object‘s (space body) position in plane or space.

Trajectory

Path that moving object (space body) follows through space.

Orbit

Curved path of moving object (space body) around other object (space body).

Distance

Lenght (interstice) between objects (space body) in plane or space.

Velocity

Completed distance of object (space body) per unit of time.

Mathematics

Science of structures, variations and spatial patterns.

Physics

Science of all forms of matter.

Chemistry

Science of chemical elements and nature of materials.

Informatics

Science of information processing and storage, the use of computers.

Biology

Science of life and living organisms.

Astronomy

Science of celestial objects and processes outside the atmosphere of Earth.

Geography

Science of the lands, the features, the inhabitants and the phenomena of Earth.

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Contract was carried out “Funded by the Government of Lithuania through an ESA Contract under the PECS (Plan for European Cooperating States)”
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