

B.L.D.E. Association's  
S.B ARTS AND K.C.P SCIENCE COLLEGE,  
VIJAYAPUR



Department of Physics & Electronics

**Seminars (2018-19)**

## NOTICE

Date: 15.03.2019

All the Physics & Electronics opted students (for the academic year 2018-19) are here by informed to contact to your concerned staff member to prepare and deliver the seminar classes without fail.

Seminar classes are compulsory to all the semester students.

Principal

Principal,

**S.B. Arts & K.C.P. Se. College  
Bijapur,**

**IQAC Co-ordinator**

**IQAC, Co-ordinator**

**S.B.Arts & K.C.P.Science College,  
Vijayapur.**

HOD

Head

**Department of Physics  
S.B.Arts & K.C.P.Science College  
Vijayapur-586103.**

NAME:- ARUNKUMAR .R. DESAI

21-03-2019

CLASS:- B.S.C 2<sup>ST</sup> SEM

SECTION:- 'B'

SUBJECT:- PHYSICS SEMINAR

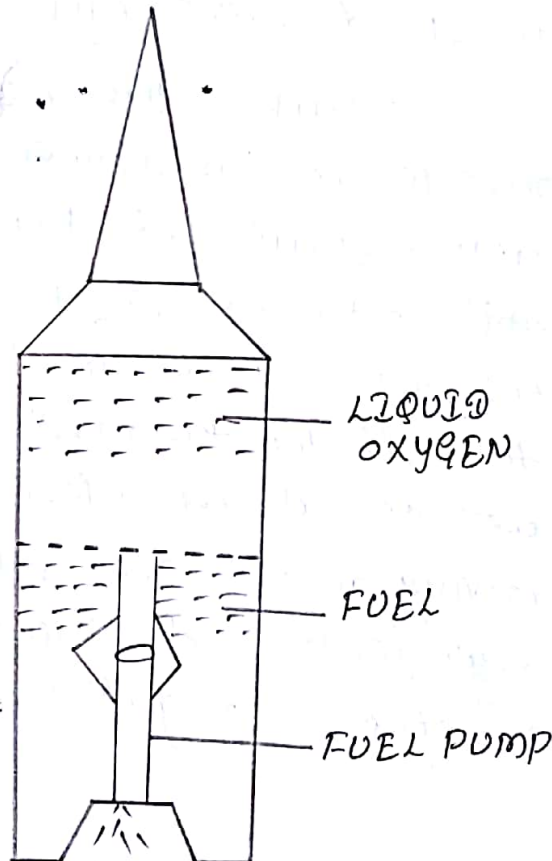
COLLEGE:- SB ARTS & KCP SCIENCE COLLEGE VIJAYAPUR.

Date:- 21-08-2019.

18-19

## Student Seminar.

### SINGLE STAGE ROCKET CONSERVATION OF MOMENTUM IN CASE OF VARIABLE MASS



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## ROCKET:-

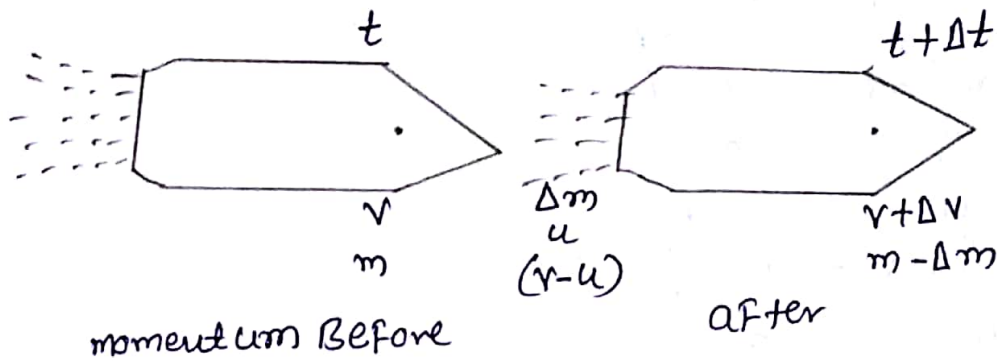
It is a device which is used to place a satellite into an orbit, It is based on the principle of conservation of momentum under variable mass.

• A rocket carries both the fuel and the oxidiser, which burn in combustion chamber within the rocket, when the rocket is fired, the exhaust gases rush downward at high speed and push the rocket upward. Thus the thrust on the rocket is supplied by the reaction force of the high speed gases ejected at the rear.

• Suppose the rocket along with its fuel mass  $m$  and is moving with a velocity  $v$  at any instant. Let this velocity be considered with respect to some inertial frame of reference which is assumed to be the earth. After a time  $dt$ , let the mass of fuel ejected be  $dm$  with an exhaust velocity  $v_e$  with respect to the moving rocket. The velocity  $v_e$  is constant and being downward relative to the rocket is an intrinsic negative quantity.



## THE ROCKET EQUATION



$$m v = (m - \Delta m)(v + \Delta v) + \Delta m(v - u)$$

$$m v = m v + m \Delta v - \Delta m v - \Delta m \Delta v + \Delta m v - \Delta m u$$

small term ignore

$$m \Delta v = u \Delta m$$

$$m \frac{\Delta v}{\Delta t} = u \frac{\Delta m}{\Delta t}$$

$$m \cdot \frac{dv}{dt} = u \left( \frac{-dm}{dt} \right)$$

$$\therefore m(t) = m$$

$$m(t + dt) = m - dm$$

$$m(t + dt) - m(t)$$

$$= m - dm - m$$

$$T = m a = -u \cdot \frac{dm}{dt} \quad \text{--- (1)}$$

$\therefore$  Thrust is equal to the minus the Relative velocity of the exhaust gases into the rate of change of mass of the rocket.

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$$m \Delta v = u \Delta m$$

∴ From this eq<sup>n</sup>

$$m \Delta v = u \Delta m$$

$$m \int_{v_i}^{v_f} dv = -u \int_{m_i}^{m_f} dm$$

$$\int_{v_i}^{v_f} dv = -u \int_{m_i}^{m_f} \frac{1}{m} dm$$

$$v_f - v_i = -u \left[ \ln m \right]_{m_i}^{m_f}$$

$$\therefore v_f - v_i = -u \ln \left[ \frac{m_f}{m_i} \right]$$

∴ This equation finds velocity of rocket as the mass of the rocket reduces owing to fuel turning to exhaust gas.

Chait  
21/08/19.

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K.C.P. Science College  
Vijayapur

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K.C.P. Science College  
Vijayapur

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S.B ARTS AND K.C.P SCIENCE COLLEGE, VIJAYAPUR  
DEPARTMENT OF PHYSICS & ELECTRONICS

**Student Attendance List of Seminar**

Class: B.Sc- I semester

Subject: Physics

Date: 21-08-2019

Staff: S.B.Pattadakal

Name of the student: Arun Desai

Topic: Rocket

Roll No	Signature.	Roll No	Signature
330		259	
250	S.J. Inagond.	209	
286		187	
329		333	
290		236	
271		377	
368	A.B. Biradar	365	
243		378	
241		312	
326	S.R. Uppar	197	
388			
198			
299			
244			
332			
369			
370			
270	A.R. Changa		
231	V.S. Mangamavan		
216			
218			
352			
356	Buli		
217	N.D. K.		
319			
323			
228	V.P. Bhojwale		

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Staff: S.B.Pattadakal      Name of the student: Arun Desai

Topic: Rocket

Roll No	Signature.	Roll No	Signature
200	<del>Prasad</del>	360	<del>Prasad</del>
222	Prasad	248	B.P.P. Prasad
284	Prasad	<del>248</del>	<del>Prasad</del>
272	Prasad	249	S. Sankar
287	Prasad	196	Prasad
272	v. Prasad	348	Prasad
376	Prasad	344	Prasad
230	Prasad	337	Prasad
380	Prasad	206	Prasad
285	Prasad	225	Prasad
361	Prasad	220	N. Prasad
347	Prasad	3	
273	Prasad		
281	Prasad		
324	Prasad		
374	Prasad		
383	Prasad		
233	Prasad		
351	Prasad		
322	Prasad		
325	V.H.M		
334	Prasad		
315	Prasad		
275	Prasad		
355	Prasad		
308	Prasad		
304	Prasad		

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*[Handwritten signature]*



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Staff: S.B.Pattadakal      Name of the student: Arun Desai

Topic: Rocket

Roll No	Signature.	Roll No	Signature
242		341	
241		342	
239		276	
239		293	
232	P.S.M	294	S.B. Patil
335		338	Ravanyale
349		298	
312	Akmalgata	214	Soutra
235	Atiramath	215	Kaure
278	L.R. Hitnalli	234	
279	A. B. Rathod.	262	
255	G. D. Chavan.		
328			
303	A.B.A		
207			
199	P.M.Kumbar		
305			
327			
289			
282			
240			
357			
190			
358			
367			
343			
340	AKN		

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38

## REPORT

Date: 05.07.2018

The department of Physics & Electronics conducted the seminar classes for the B.Sc odd and even semester students for the academic year 2018-19 to encourage the student and to enhance their language skills.

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