English (Official)

### A. Expansion of Universe

Question	Answer	Marks
A.1	$A_1 =$	
(1.3 pt.)		
A.2	$A_2 = 48^{\text{TH}} \qquad $	
(0.9 pt.)	YOGYAKARTA- INDONESIA 16 - 24 JULY 2017	
A.3 (1.2 pt.)	(i) $W_r =$	
	(ii) $W_m =$	
	(iii) $w_{\Lambda} =$	

English (Official)

# A. Expansion of Universe

Question	Answer	Marks
A.4 (1.2 pt.)	(i) $a(t) =$	
(1.2 με.)	(ii) $a(t) =$	
	(iii) $a(t) =$	
A.5 ( <b>0.1 pt.</b> )	48 <sup>TH</sup> PP 2017  YOGYAKARTA- INDONESIA 16 - 24 JULY 2017	
A.6		
(0.3 pt.)		

### B. Motivation to Introduce Inflation Phase and Its General Conditions

Question	Answer	Marks
B.1	$(\Omega-1)=$	
(0.5 pt.)		
( <b>0.5 pt.</b> )		
	$(\Omega-1)=$	
B.2		
(0.3 pt.)		

# **Theory**

English (Official)

AT3

B.3	
(0.9 pt.)	
B.4	
(0.2 pt.)	

### C. Inflation Generated by Homogenously Distributed Particles

Question	48 <sup>IH</sup> Answer	Marks
C.1 ( <b>1.7 pt.</b> )	YOGYAKARTA- INDONESIA     16 - 24 JULY 2017	
	$\eta_{V}pprox$	
	$\frac{dN}{d\phi} \approx$	

# D. Particles Inflation with a Simple Potential

Question	Answer	Marks
D.1	$ \phi_{end}  pprox$	
(0.5 pt.)	Ψena ∼	
(0.2 p.i.)		
D.2	r =	
5.2		

English (Official)

( <b>0.9 pt.</b> )		
	$n_{s} =$	

