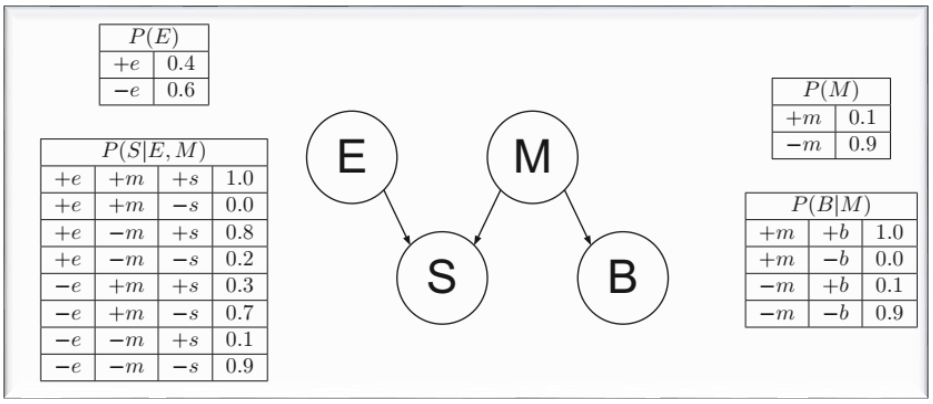
Ahsanullah University of Science and Technology
Department of Computer Science and Engineering
4th Year 2nd Semester Quiz-3 (Set-A)
Course No: CSE 4213 Course Title: Pattern Recognition
Time: 30 minutes Full Marks: 10

Roll: **Name:**

1. A Bayesian network and corresponding conditional probability tables for are shown below. Compute the following probabilities. **[6]**



$P(E)$	
$+e$	0.4
$-e$	0.6

$P(M)$	
$+m$	0.1
$-m$	0.9

$P(S\|E,M)$			
$+e$	$+m$	$+s$	1.0
$+e$	$+m$	$-s$	0.0
$+e$	$-m$	$+s$	0.8
$+e$	$-m$	$-s$	0.2
$-e$	$+m$	$+s$	0.3
$-e$	$+m$	$-s$	0.7
$-e$	$-m$	$+s$	0.1
$-e$	$-m$	$-s$	0.9

$P(B\|M)$		
$+m$	$+b$	1.0
$+m$	$-b$	0.0
$-m$	$+b$	0.1
$-m$	$-b$	0.9

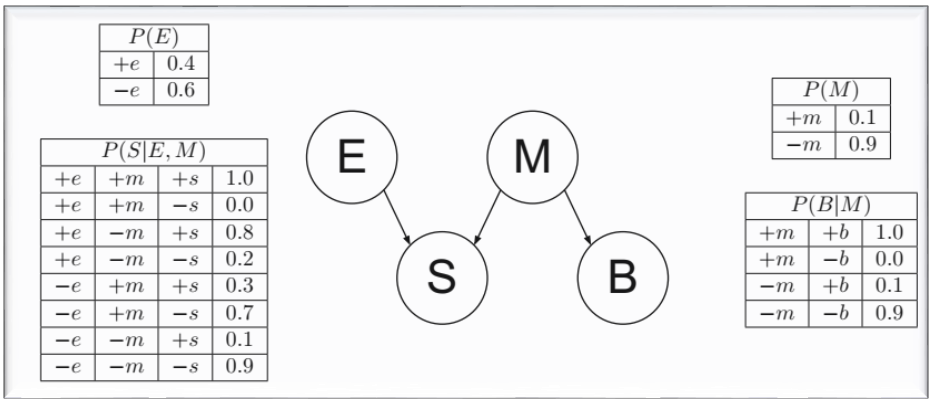
(a) *P (-e, -s, -m, -b)*
(b) *P(+b)*
(c) *P(+m | + b)*

2. What is Maximum a Posteriori (MAP) estimation in statistical inference and how does it differ from Maximum Likelihood Estimation (MLE)? **[4]**

Ahsanullah University of Science and Technology
Department of Computer Science and Engineering
4th Year 2nd Semester Quiz-3 (Set-B)
Course No: CSE 4213 Course Title: Pattern Recognition
Time: 30 minutes Full Marks: 10

Roll: **Name:**

1. A Bayesian network and corresponding conditional probability tables for are shown below. Compute the following probabilities. **[6]**



$P(E)$	
$+e$	0.4
$-e$	0.6

$P(M)$	
$+m$	0.1
$-m$	0.9

$P(S\|E,M)$			
$+e$	$+m$	$+s$	1.0
$+e$	$+m$	$-s$	0.0
$+e$	$-m$	$+s$	0.8
$+e$	$-m$	$-s$	0.2
$-e$	$+m$	$+s$	0.3
$-e$	$+m$	$-s$	0.7
$-e$	$-m$	$+s$	0.1
$-e$	$-m$	$-s$	0.9

$P(B\|M)$		
$+m$	$+b$	1.0
$+m$	$-b$	0.0
$-m$	$+b$	0.1
$-m$	$-b$	0.9

(a) *P (+e, +s, +m, +b)*
(b) *P(-b)*
(c) *P(+m | + b)*

2. What is Maximum a Posteriori (MAP) estimation in statistical inference and how does it differ from Maximum Likelihood Estimation (MLE)? **[4]**