



**MODUL TOPIKAL  
SOALAN PERCUBAAN SPM 2023**

**TOPIK TINGKATAN 5**

**BAB 5**

**TABURAN KEBARANGKALIAN  
( PROBABILITY DISTRIBUTION)**

**SUMBER SOALAN:  
SOALAN – SOALAN PERCUBAAN**

TERENGGANU  
NEGERI SEMBILAN  
KELANTAN  
SABAH  
SBP  
MELAKA  
SELANGOR SET 1  
PERAK

**SKEMA JAWAPAN**

**DISUSUN OLEH:**

**PN. NOORUL HUDA BINTI MOHD HASHIM**  
(SMK TAMAN TASIK, TAIPING)

**PN ZAINAB BINTI ABD RAHMAN**  
(SMK CONVENT, TAIPING)

**SOALAN 1 : SOALAN PERCUBAAN SPM NEGERI TERENGGANU 2023 (KERTAS 1)**

<b>3</b>	(a) 0.001447 [Panduan : ${}^{10}C_2 (0.7)^2 (0.3)^{10-2}$ ]	N1	<b>4</b>
	(b) Tulis $1 - P(X=0) - P(X=1)$ @ $P(X=2)+P(X=3)+\dots+P(X=10)$	P1	
	$1 - {}^{10}C_0 (0.3)^0 (0.7)^{10} - {}^{10}C_1 (0.3)^1 (0.7)^9$ @ setara	K1	
	0.8507	N1	

**SOALAN 2 : SOALAN PERCUBAAN SPM NEGERI TERENGGANU 2023 (KERTAS 2)**

<b>10</b>	(a) $P(X \geq 1) > 0.9$	<b>P1</b>	<b>10</b>
	$P(X = 0) < 0.1$	<b>P1</b>	
	${}^n C_0 \left(\frac{1}{3}\right)^0 \left(\frac{2}{3}\right)^n < 0.1$	<b>K1</b>	
	$n \log_{10} \frac{2}{3} < \log_{10} 0.1$ & selesaikan	<b>K1</b>	
	$n = 6$	<b>N1</b>	
	(b) $P(X > 50.1) = 0.025$ @ $P(X < 50.1) = 0.975$ @ $P(X > 34.3) = 0.8849$		
	$P\left(Z > \frac{50.1 - \mu}{\sigma}\right) = 0.025$ @ $P\left(Z > \frac{34.3 - \mu}{\sigma}\right) = 0.8849$	<b>K1</b>	
	$\frac{50.1 - \mu}{\sigma} = 1.96$ @ $\frac{34.3 - \mu}{\sigma} = -1.2$	<b>K1</b>	
	$\frac{50.1 - \mu}{1.96} = \frac{34.3 - \mu}{1.2}$	<b>K1</b>	
	$\mu = 40.3$ $\sigma = 5$	<b>N1</b> <b>N1</b>	

**SOALAN 3 : SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2023 (KERTAS 1)**

12	(a)	$a + b = 0.29$	N1
	(b)	${}^5C_0 \times p^0 \times q^5 = 0.05$	K1
		$q = 0.5493$	N1
			<b>3 markah</b>

**SOALAN 4 : SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2023 (KERTAS 2)**

NO	PERATURAN PEMARKAHAN	MARKAH
		K1
9(a)(i)	$n \times \frac{1}{20} = 56$	N1
	1120	K1
(ii)	${}^7C_0 \left(\frac{1}{20}\right)^0 \left(\frac{19}{20}\right)^7$ atau ${}^7C_1 \left(\frac{1}{20}\right)^1 \left(\frac{19}{20}\right)^6$ atau ${}^7C_2 \left(\frac{1}{20}\right)^2 \left(\frac{19}{20}\right)^5$	K1
	${}^7C_0 \left(\frac{1}{20}\right)^0 \left(\frac{19}{20}\right)^7 + {}^7C_1 \left(\frac{1}{20}\right)^1 \left(\frac{19}{20}\right)^6 + {}^7C_2 \left(\frac{1}{20}\right)^2 \left(\frac{19}{20}\right)^5$	N1
	0.9962	K1
(b)(i)	$P(X > 3700) = 0.0765$ atau $z = 1.429$	K1
	$\frac{3700 - 3250}{\sigma} = 1.429$	N1
	314.91	K1
(ii)	$12\,000 \times 0.4235$	N1
	5082	
		<b>10 markah</b>

**SOALAN 5 : SOALAN PERCUBAAN SPM NEGERI KELANTAN 2023 (KERTAS 1)**

12 (a)	(i) ${}^4C_4(p^4)(q^0)$ atau setara $p = \sqrt[4]{m}$  (ii) $P(X \geq 1) = 1 - P(X = 0)$ $= 1 - k$	K1  N1  K1 N1	
12 (b)	(i) 15  (ii) 3	N1  N1	

**SOALAN 6 : SOALAN PERCUBAAN SPM NEGERI KELANTAN 2023 (KERTAS 2)**

10 (a)(i)	${}^{10}C_0(0.7)^0(0.3)^{10}$ atau ${}^{10}C_1(0.7)^1(0.3)^9$ atau ${}^{10}C_2(0.7)^2(0.3)^8$  ${}^{10}C_0(0.7)^0(0.3)^{10} + {}^{10}C_1(0.7)^1(0.3)^9 + {}^{10}C_2(0.7)^2(0.3)^8$ 0.00159	K1  K1 N1	
(a)(ii)	Bilangan Pelajar = $\frac{280}{0.7}$ 400	K1 N1	
10 (b)(i)	$z = 1.406$  $\frac{70 - m}{5} = 1.406$ $m = 62.97$	P1  K1 N1	10
(b)(ii)	$\frac{50 - *62.97}{5}$ 0.00474	K1 N1	

**SOALAN 7 : SOALAN PERCUBAAN SPM NEGERI SABAH 2023 (KERTAS 1)**

8	a) $X = \{0, 1, 2, 3, 4\}$	N1	7
	b) i) $P(X = 4) = 1 - 0.959$ ${}^4C_4 p^4 q^0 = 0.041$ $p^4 = 0.041$ $p = 0.45$ ii) $\text{Min} = 4 \times 0.45$ $= 1.8$ $\text{Varians} = 4 \times 0.45 \times 0.55$ $= 0.99$ <b>Nota:</b> Markah K1 diberi di salah satu rumus min atau varians.	K1 K1 N1 N1 N1	

**SOALAN 8 : SOALAN PERCUBAAN SPM NEGERI SABAH 2023 (KERTAS 1)**

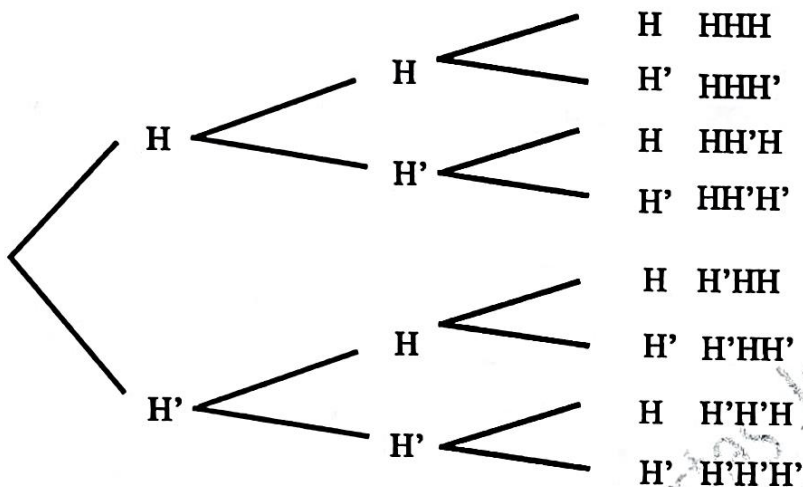
9	$P\left(\frac{40-45}{9.5} < Z < \frac{k-45}{9.5}\right) = 0.1025$ $z = -0.248$ $-0.248 = \frac{k-45}{9.5}$ $k = 42.644$	K1 K1 N1	3
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**SOALAN 9 : SOALAN PERCUBAAN SPM NEGERI SABAH 2023 (KERTAS 2)**

9	a) $1 - P(X = 7) - P(X = 8)$ $= 1 - {}^8C_7(0.85)^7(0.15)^1 - {}^8C_8(0.85)^8(0.15)^0$ $= 1 - 0.3487 - 0.2725$ $= 1 - 0.3487 - 0.2725$ $= 0.3428$	K1 K1	10
	b) i) $P\left(\frac{52-55}{7.5} < Z < \frac{72-55}{7.5}\right)$ $= P(-0.400 < Z < 2.267)$ $= 0.6437$ $\frac{258}{N} = 0.6437$ $N = 401$	K1 K1 N1	
	ii) $P\left(Z > \frac{m-55}{7.5}\right) = 0.9812$ $z = -2.08$ $-2.08 = \frac{m-55}{7.5}$ $m = 39.4, \text{ markah lulus} = 40$	K1 K1 K1 N1	

**SOALAN 10 : SOALAN PERCUBAAN SPM SBP 2023 (KERTAS 1)**

**12(a)(i)**



**3**

Rajah yang lengkap **K1**

Tunjukkan semua kesudahan **N1**

(ii)  $X = \{0,1,2,3\}$ , boleh dibilang **N1**

**3**

(b)  $q = 1 - p$  **P1**

$12p(1-p) = \frac{5}{3}$  **K1**

$p = \frac{1}{6}, p = \frac{5}{6}$  **N1**

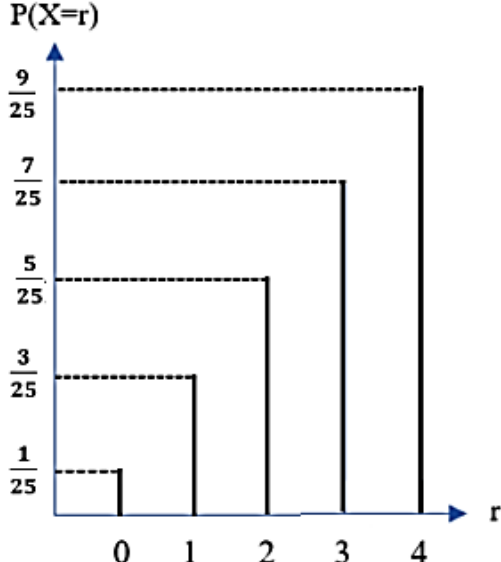
**6**

**SOALAN 11 : SOALAN PERCUBAAN SPM SBP 2023 (KERTAS 2)**

<p><b>11(a)</b></p>	<p><math>{}^5C_3(0.9452)^3(0.0548)^2</math>      <b>K1</b></p> <p>0.7544      <b>N1</b></p>	<p>2</p>	
<p><b>(b)</b></p>	<p><math>P(X &gt; 2) = P(X = 3) + P(X = 4)</math>      <b>K1</b></p> <p><math>{}^4C_3(0.7544)^3(0.2456)^1</math> @ <math>{}^4C_4(0.7544)^4(0.2456)^0</math>      <b>K1</b></p> <p>0.7457 // 0.7456      <b>N1</b></p>	<p>3</p>	
<p><b>(c)(i)</b></p>	<p><math>P(Z &lt; \frac{2-1.2}{\sigma}) = 0.9452</math> @ <math>P(Z &gt; \frac{0.8}{\sigma}) = 0.0548</math>      <b>K1</b></p> <p><math>\frac{2-1.2}{\sigma} = 1.60</math>      <b>N1</b></p> <p><math>\sigma = 0.5</math>      <b>N1</b></p>	<p>3</p>	
<p><b>(c)(ii)</b></p>	<p><math>P(Z &gt; \frac{1.5-1.2}{0.5})</math>      <b>K1</b></p> <p>0.2743      <b>N1</b></p>	<p>2</p>	<p><b>10</b></p>



**SOALAN 12 : SOALAN PERCUBAAN SPM NEGERI MELAKA 2023 (KERTAS 1)**

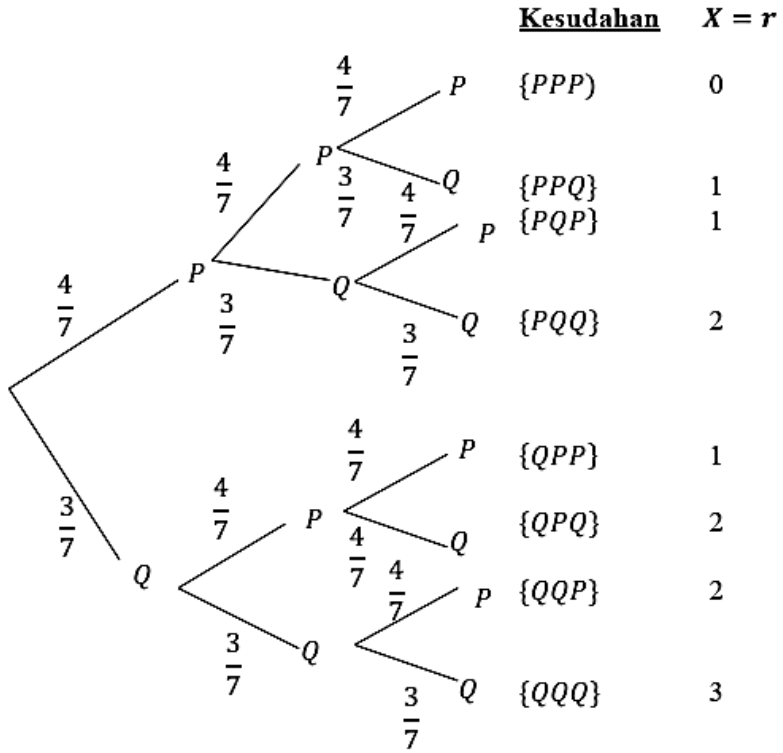
15. (a)	${}^6C_6 p^6 q^{6-6} = \frac{1}{64}$ $p^6 = \frac{1}{64}$ $p = \frac{1}{2}$	1													
(b) (i)	$m(2(0) + 1) + m(2(1) + 1) + m(2(2) + 1) + m(2(3) + 1) + m(2(4) + 1) = 1$ $m = \frac{1}{25}$	1,1													
(c)	<table border="1"> <thead> <tr> <th>r</th> <th>0</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>P(X=r)</td> <td><math>\frac{1}{25}</math></td> <td><math>\frac{3}{25}</math></td> <td><math>\frac{5}{25}</math></td> <td><math>\frac{7}{25}</math></td> <td><math>\frac{9}{25}</math></td> </tr> </tbody> </table> 	r	0	1	2	3	4	P(X=r)	$\frac{1}{25}$	$\frac{3}{25}$	$\frac{5}{25}$	$\frac{7}{25}$	$\frac{9}{25}$	1	8
r	0	1	2	3	4										
P(X=r)	$\frac{1}{25}$	$\frac{3}{25}$	$\frac{5}{25}$	$\frac{7}{25}$	$\frac{9}{25}$										

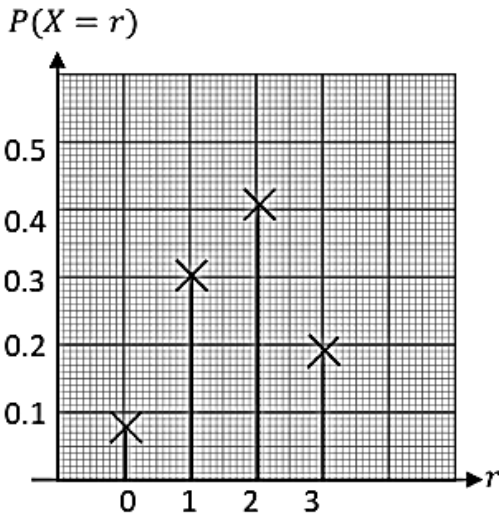
**SOALAN 13 : SOALAN PERCUBAAN SPM NEGERI MELAKA 2023 (KERTAS 2)**

<b>11 (a)</b>	$30C_0(0.01^0)(0.99^{30})$		
	atau $30C_1(0.01^1)(0.99^{29}) \times 30C_0(0.01^0)(0.99^{30})$	1	
	$1 - [30C_0(0.01^0)(0.99^{30}) + 30C_1(0.01^1)(0.99^{29}) \times 30C_0(0.01^0)(0.99^{30})]$	1	
	9.45%	1	
	905 atau 906	1	
<b>(b) i</b>	$P\left(z \leq \frac{X - 50}{5}\right) = 0.1$	1	<b>10</b>
	$\frac{X - 50}{5} = -1.282$	1	
	43.59	1	
<b>(b) ii</b>	$P\left(z \geq \frac{53.73 - 50}{5}\right)$	1	
	$0.2278 \times 200$	1	
	46	1	



SOALAN 15 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1 2023 (KERTAS 2)

9	(a)	$X = \{0, 1, 2, 3\}$	P1
	(b)	<p>Lukis dengan betul sekurang-kurangnya 1 dahan betul Lukis semua dengan betul</p>  <p style="text-align: right;"><b>Kesudahan</b>    <math>X = r</math></p>	K1 N1
		<p>Senaraikan semua kesudahan dengan betul Senaraikan semua <math>X = r</math></p>	P1 P1
	(c)	<p>Dilihat <math>P = \frac{4}{7}</math> dan <math>Q = \frac{3}{7}</math> Mencari sekurang-kurangnya 1 kebarangkalian kesudahan dengan betul Senaraikan <b>semua</b> kesudahan kebarangkalian dengan betul</p> $P(X = 0) \rightarrow \frac{3}{7} \times \frac{3}{7} \times \frac{3}{7} = \frac{27}{343} // 0.08$ $P(X = 1) \rightarrow 3 \left( \frac{3}{7} \times \frac{4}{7} \times \frac{3}{7} \right) = \frac{108}{343} // 0.31$ $P(X = 2) \rightarrow 3 \left( \frac{3}{7} \times \frac{4}{7} \times \frac{4}{7} \right) = \frac{144}{343} // 0.42$ $P(X = 3) \rightarrow \frac{4}{7} \times \frac{4}{7} \times \frac{4}{7} = \frac{64}{343} // 0.19$	P1 K1 N1
			K1

		<p>Lukis dengan betul sekurang-kurangnya 1 betul Lukis semua dengan betul</p> 	N1	
				10

**SOALAN 16 : SOALAN PERCUBAAN SPM NEGERI PERAK 2023 (KERTAS 1)**

11.	(a)	$m = 1 - \frac{1}{27} - \frac{8}{27} - \frac{13}{27}$ $m = \frac{5}{27}$ $P(X=0) = \frac{1}{27}$ ${}^3C_0 (p)^0 (q)^{3-0} = \frac{1}{27}$ $q^3 = \frac{1}{27}$ $q = \frac{1}{3}$ $p + q = 1$ $p + \frac{1}{3} = 1$ $p = \frac{2}{3}$	1	
	(b)	$P(X < 3) = P(X=0) + P(X=1) + P(X=2)$ $P(X < 3) = \frac{1}{27} + \frac{8}{27} + \frac{13}{27}$ $= \frac{22}{27}$	1	5
			1	

**SOALAN 17 : SOALAN PERCUBAAN SPM NEGERI PERAK 2023 (KERTAS 2)**

10	(a)	$P(X < 1900) = 0.8949$ ATAU $P(X \geq 1900) = 0.1151$  $\frac{1900-1650}{\sigma} = 1.20$  $\sigma = 208.33$  $P\left(Z < \frac{1500-1650}{208.33}\right)$ $P(Z < -0.72)$  0.2358	1  1  1  1  1	10	
	(b)	i	$1 - P(X = 0) - P(X = 1)$  $1 - {}^7C_0(0.2358)^0(0.7642)^7 - {}^7C_1(0.2358)^1(0.7642)^6$  0.5190	1  1  1	
		ii	$\sigma = \sqrt{(25)(0.2358)(0.7642)}$  2.122 or 2.1225	1  1	