MAJLIS PEPERIKSAAN MALAYSIA

SASBADI

Laporan Peperiksaan STPM 2018

Mathematics (M) (950)

Laporan Peperiksaan STPM 2018

Mathematics (M) (950)

SASBADI SDN. BHD. (139288-X)
(Anak syarikat milik penuh Sasbadi Holdings Berhad (1022660-T))
PETALING JAYA

MAJLIS PEPERIKSAAN MALAYSIA

Diterbitkan oleh

Sasbadi Sdn. Bhd. (139288-X),
(Anak syarikat milik penuh Sasbadi Holdings Berhad (1022660-T))
Lot 12, Jalan Teknologi 3/4, Taman Sains Selangor 1,
Kota Damansara, 47810 Petaling Jaya,
Selangor Darul Ehsan.
Tel: +603-6145 1188
Faks: +603-6145 1199
Laman web: www.sasbadisb.com
e-mel: enquiry@sasbadi.com

Majlis Peperiksaan Malaysia,
Persiaran 1, Bandar Baru Selayang,
68100 Batu Caves,
Selangor Darul Ehsan.

ISBN 978-983-77-1305-5

CONTENTS

MATHEMATICS (M) (950/1)

OVERALL PERFORMANCE

In Semester 1, 719 candidates sat for the examination of this subject and 34.92% of them obtained a full pass.

The percentage of each grade is as follows:

Grade	A	A–	B+	B	B–	C+	C	C–	D+	D	F
Percentage	6.54	2.23	2.64	3.20	4.45	9.74	6.12	3.48	4.17	3.76	53.69

CANDIDATES' RESPONSES

General comments

In general, the quality of the answer was average. Some candidates performed very well and some performed badly. For the above average candidates, generally they were able to present systematic work. The moderate candidates seemed to make careless mistakes.

Comments on individual questions

Question 1

For the first part, most of the candidates were able to show $(x + 1)$ was a linear factor and able to find the prime quadratic factor by using long division. However, there were some of them who were unable to determine which one was the prime quadratic factor.

For the second part, most of the candidates used the cross multiplication when involving rational inequality. Even some who did not cross multiply, they failed to show that the prime quadratic factor was always positive.

Answer: $\{x \mid -2 < x < -1\}$

Question 2

Most of the candidates were able to get the expansion correctly because the formula was given. Some made mistake in positive and negative signs. For the range of values for which the expansion of valid, many candidates could determine the range for term $|2x| < 1$ but failed to determine the range for expansion because of the term $|-3x| < 1$.

Answer: $1 - 3x + 5x^2 - \frac{35}{3}x^3 + \ldots, \left\{x : -\frac{1}{3} < x < \frac{1}{3}\right\}$

Question 3

For part (*a*), most of the candidates managed to find $\mathbf{M}^2$ correctly but when showing $\mathbf{M}^2 = \mathbf{M} + 20\mathbf{I}$, they did not know how to present the answer in the correct way. They were not able to deduce $\mathbf{M}^{-1}$ from part (*a*). They calculated the inverse matrix by using row elementary operation.

Answer: $\mathbf{M}^{-1} = \begin{pmatrix} -\frac{1}{10} & \frac{1}{10} & -\frac{1}{5} \\ \frac{3}{20} & \frac{3}{20} & \frac{1}{10} \\ -\frac{3}{20} & \frac{1}{20} & \frac{1}{10} \end{pmatrix}$

Question 4

Most of the candidates were not able to answer this question because they were unable to get rid of the modulus term and to evaluate the left and right limits. Specifically, they failed to notice that $|x-1|$ could be expressed into 2 different expressions $(x-1)$ for $x > 1$ and $-(x-1)$ for $x < 1$. Besides, they only stated the existence or non-existence of limit without stating the reason.

Answer: Limit does not exist

Question 5

Most of the candidates were able to sketch the graph correctly, however, some candidates left out the asymptotes. Most of them were able to find $\int \ln(x-2)\,\mathrm{d}x$ correctly by using integration by parts but they failed to integrate $\int \frac{x}{x-2}\,\mathrm{d}x$.

Answer: Area $= 2\ln 2 - 1$

Question 6

For part (*a*), most of the candidates were able to use technique of separable variable to solve the differential equation, but some did not write y in terms of x. The common mistake made by the candidates was they forget the constant c after integration. However, many were not able to answer part (*b*).

Answers: (*a*) $y = \frac{3}{3-x}$

Question 7

For part (*a*), most of the candidates did very well in writing the augmented matrix and reducing it to row echelon form. For part (*b*), many were not able to deduce the values of m and k such that the system has no solution, infinitely many solutions and a unique solution. Many did badly in part (*c*) and (*d*), because they were unable to get the general solution.

Answers: (*b*) (i) $m = -1$, $k \neq -1$, no solution; (ii) $m = -1$, $k = -1$, infinitely many solutions;
(iii) $m \neq -1$, $k \in \mathbb{R}$, unique solution; (*d*) $x = \frac{1}{5}(2k-3)$

Question 8

Not many candidates attempted this question. For part (*a*), most candidates could find $a = -6$, but some substituted $x = 1$ using $y'(1) = 0$ to get $b = 8$, which is wrong. For parts (*b*) and (*c*), many were able to answer correctly. However, some of them tried to find the other point of inflexion using $y'(1) = 0$ instead of $y''(1) = 0$. For part (*d*), many did not sketch the graph correctly because of the inflexion points.

Answers: (*b*) (–1, –16); (*c*) (–2, –27)

MATHEMATICS (M) (950/2)

OVERALL PERFORMANCE

In Semester 2, 707 candidates sat for the examination for this subject and 72.00% of them obtained a full pass.

The percentage of each grade is as follows.

Grade	A	A–	B+	B	B–	C+	C	C	D+	D	F
Percentage	6.93	6.51	12.31	10.18	13.15	12.31	10.61	4.38	4.38	2.55	16.69

CANDIDATES' RESPONSES

General comments

In general, the performance of candidates was satisfying. The candidates were good in answering the quantitative questions but weak in answering qualitative questions. The performance of the candidates showed a wide range of mathematical ability among STPM candidates. The answers presented by "good candidates" showed full understanding of statistical concepts with nearly perfect working. They showed a systematic analysis of the problems and good planning in their answers. Almost all candidates preferred to answer the questions in English.

Comments on individual questions

Question 1

The performance of the candidates was moderate. Some of the candidates were unable to plot the histogram with unequal class sizes. Many candidates were unable to construct a correct histogram where they did not include the correct unit in their answer in part (*b*). Almost all of them failed to give correct reasons for explaining which aspects of the data were measured by mean and the standard deviation.

Answers: (*a*) Mean = RM68 800, standard deviation = RM26 316.53

Question 2

Overall the candidates' performance on this question was good for only part (*a*). However, majority of them performed quite poorly for part (*b*). Many candidates had used the result of $P(A|B')$ to determine the independence of events A and B instead of $P(A|B)$.

Answers: (*a*) $P(A \cup B) = \frac{5}{12} + \frac{3}{4} - \frac{1}{6} = 1$, Hence exhaustive; (*b*) Not independent

Question 3

The performance of the candidates was quite good. Most of the candidates could answer part (*a*) correctly but some candidates could not use the "new mean" to calculate $P(Y = 6)$ in part (*b*).

Answers: (*a*) 0.1107, 0.111 or 0.110674; (*b*) 0.122138 or 0.122

Question 4

Overall the performance of the candidates was good for parts (*a*) to (*c*). However, almost all candidates had shown weak ability in answering part (*d*) which requires interpretation. Also, almost all candidates were unable to comment on "why the estimation may be differs from the actual written mark" in part (*d*).

Answers: (*b*) $r = 0.4343$; (*c*) $a = -13.03$, $b = 4.34$, $y = -13.03 + 4.34x$

Question 5

Overall the performance of the candidates was moderate. Many of the candidates used the wrong formula for weighted average price relatives in part (*a*). The common mistake was letting $w = p_n q_n$, instead of quantity given in the question. Some candidates did not give their answers in two decimal places.

Answers: (*a*) 172.31; (*b*) 136.02

Question 6

Most of candidates failed to explain why there are a trend and a seasonal component in the time series. Many candidates were able to forecast the revenue. However, some candidates had lost marks due to using the multiplicative model to find the forecasted revenue. Some candidates lost marks because did not give the answer in the correct unit (RM*x* million).

Answer: $T = 17.71$

Question 7

This question was not preferable by most candidates. But to those who had chosen to answered, the overall performance was good as compared to those who had chosen Question 8. Some of the candidates were facing difficulty in sketching the graph of probability density function correctly.

Answers: (*b*) $m = 2.67$ thousand litres; (*e*) $\frac{1}{27}$

Question 8

Most of the candidates made good attempt to answer this question in Section B and the overall performance was good. This question was proved to be the source of high mark for most of the candidates especially those who performed moderately and weakly. Some common mistakes in this question were wrongly assume additive model, unable to interpret the seasonal index correctly and unable to deduce the seasonal adjusted time series as compared to the original time series.

Answers: (*c*) Highest sale: Quarter 2, Lowest sale: Quarter 4

MATHEMATICS (M) (950/3)

OVERALL PERFORMANCE

In Semester 3, 704 candidates sat for examination for this subject and 75.43% of them obtained a full pass.

The percentage of each grade is as follows.

Grade	A	A–	B+	B	B–	C+	C	C–	D+	D	F
Percentage	8.38	7.53	6.82	10.80	17.05	13.49	11.36	4.12	3.41	3.13	13.92

CANDIDATES' RESPONSES

General comments

The performance of the candidates showed a wide range of mathematical ability among STPM candidates. There was significant difference in the quality of scripts produced by different centers.

The answers presented by "good candidates" showed full understanding of the mathematical concepts with nearly perfect working especially Question 6 and Question 8. They showed systematic analysis of the problems and good planning in their answers. Candidates gave well-presented answers to "familiar questions" especially Questions 2, 4, 5 and 6. The strength of the candidates was in recognising the "familiar questions" and performing the appropriate calculation to obtain the answers. Basically it was based on the topics. Some topics may be a bit tricky as to the others.

Candidates began to show weaknesses or mistake when they encountered question where careful reading of the question were necessary such as Questions 1 and 7. Many candidates did not provide the test for optimal solution for Question 2. In Question 3, candidates failed to recognise the feasible region which was in the line form. Questions 4 and 5 were considered easy questions. Question 6 was a straightforward question where graphical method was necessary.

Comments on individual questions

Question 1

The performance of the candidates was moderate. The good students were able to answer this question very well as they were able to understand the required task by the question. Many candidates made mistakes in accrued amount as RM460 instead of RM260.

Answer: $k = 5.3$

Question 2

The performance of the candidates was moderate. Most candidates failed to use second derivative test for maximum annual revenue for part (*a*). Candidates responded quite well for part (*b*).

Answers: (*a*) RM2 812 500; (*b*) q = 1 000, RM700, q = 2 000, RM650

Question 3

Many of the candidates faced some problems for equality constraint where they misunderstood the given constraint $x + 2y = 8$ as $x + 2y \leqslant 0$. This would caused them to determine maximum value of p from feasible region instead of feasible line.

Answer: $p = 16$

Question 4

This was a straightforward and easy question. Almost all candidates were able to answer this question well and all answers were well presented.

Answers: (*b*) Critical activities: *B*, *F*, Minimum completion time = 15 days

Question 5

This was a straightforward and easy question. However, some of the candidates were unable to determine the duration of the inventory on hand.

Answer: 76 days

Question 6

The performance of the candidates was quite good. The solution was supposed to be obtained by a graphical method. However, many of the candidates were unable to deliver a clear statement for the reason why strategy of special discount was chosen.

Answers: (*a*) Special discount; (*b*) $\left(\frac{5}{8}, \frac{3}{8}\right)$, Expected gain = $-\frac{7}{4}$

Question 7

This question required a careful reading as the good students were able to answer this question very well. The common mistake was without considering the accumulated value of the first 20 years contribution for next 10 years period.

Answers: (*a*) RM348 951.93; (*b*) RM298.66; (*c*) RM205 595.13

Question 8

This question was actually easy but involved a lot of calculations. The question required good understanding and careful reading in order to formulate the linear programming correctly. The candidates performed well in all steps of simplex method.

Answers: (*c*) $x_1 = 27\,000$, $x_2 = 13\,500$, Maximum return = RM5 040; (*d*) 5.6%

Laporan Peperiksaan STPM 2018

LAPORAN PEPERIKSAAN STPM 2018 MATHEMATICS (M) (950)

SASBADI SDN. BHD. (139288–X)
(Anak syarikat milik penuh Sasbadi Holdings Berhad (1022660-T))
Lot 12, Jalan Teknologi 3/4, Taman Sains Selangor 1,
Kota Damansara, 47810 Petaling Jaya, Selangor Darul Ehsan.
Tel: +603-6145 1188 Faks: +603-6145 1199
Laman web: www.sasbadisb.com e-mel: enquiry@sasbadi.com

MAJLIS PEPERIKSAAN MALAYSIA
Persiaran 1, Bandar Baru Selayang,
68100 Batu Caves, Selangor Darul Ehsan.
Tel: +603-6126 1600 Faks: +603-6136 1488
e-mel: ppa@mpm.edu.my

ISBN 978-983-77-1305-5