No. of Printed Pages—2

561 (AMTM)

[18–HRGPKAC–BPP-OY(O)]

BPP One Year (Old) Exam., 2018

ADVANCE MATHEMATICS

Full Marks : 50

Time : 2 hours

The figures in the margin indicate full marks for the questions

1. Answer the following questions : 1×7=7

(a) What is a set?

(b) Find the value of $\log_2 16$.

(c) Find the arithmetic mean of 8 and 32.

(d) Find the value of ${}^{6}P_{2}$.

(e) Write down the conjugate of $3 \quad 4i$.

(f) Find the derivative of e^{3x}.

(g) For a function $y \quad f(x)$, express $\frac{dy}{dx}$ as a limit.

2. Answer any *six* from the following questions : 2×6=12

(a) Let $A \quad \{2, 4, 6, 8\}$ and $B \quad \{6, 8, 10, 12\}$, find $A \quad B$.

(b) Show that $2\log 10 \quad 2\log 2 \quad \log 400$.

(c) Find the modulus and argument of $3 \quad 4i$.

(d) Find the roots of the following equation using factorization method :

$$x^2 \quad 3x \quad 2 \quad 0$$

(e) Find the value of $\sin 15$.

(f) State De Moivre's theorem.

(g) Evaluate $\sin 60 \quad \cos 30 \cos 45$.

(h) Find $(3x^2 \quad 4x \quad 6)\,dx$.

3. Answer any *three* from the following questions : 5×3=15

(a) Form the quadratic equation with roots 3 and 5.

(b) Find the sum of 1 3 9 to 15th term.

(c) Find the value of k if the roots of the following quadratic equation are equal :

$$x^2 \quad 7x \quad k \quad 0$$

(d) Convert the angles 75° and 135° into radians.

4. Answer any *four* from the following questions : 4×4=16

(a) If $U \quad \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $A \quad \{1, 2, 3, 4\}$, $B \quad \{2, 4, 6, 8\}$ and $C \quad \{3, 4, 5, 6\}$, then find *(i)* A , *(ii)* B , *(iii)* $(A \quad C)$ and *(iv)* (A) .

(b) Find the 7th and 11th terms of the series 1, 2, 4, 8, .

(c) Find the number of permutations of letters of the word 'BALLOON'.

(d) Show that

$$\lim_{x \ 2} \frac{2x^2 \quad 8}{x \quad 2} \quad 8$$

(e) Find the derivative of $\dfrac{x^3 \quad 4}{x^5}$.

(f) Insert 4 arithmetic means between 2 and 12.

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