1. (a) Change $\frac{3}{11}$ to a decimal.

$$11\overline{)3.^{3}0^{8}0^{3}00}\quad 0.2727$$

$0.\dot{2}\dot{7}$

.....

(1)

(b) Prove that the recurring decimal $0.\dot{3}\dot{9} = \frac{13}{33}$

$0.\dot{3}\dot{9} = x$

$39.\dot{3}\dot{9} = 100x$

$39 = 99x$

$\frac{39}{99} = x$

$x = \frac{13}{33}$

(3)

(Total 4 marks)

2. Prove that the recurring decimal $0.\dot{4}\dot{5} = \frac{15}{33}$

$0.\dot{4}\dot{5} = x$

$45.\dot{4}\dot{5} = 100x$

$45 = 99x$

$\frac{45}{99} = x$

$x = \frac{15}{33}$

(Total 3 marks)

3. Express the recurring decimal $0.2\dot{1}\dot{3}$ as a fraction.

$$0.2\dot{1}\dot{3} = x$$
$$2.\dot{1}\dot{3} = 10x$$
$$213.\dot{1}\dot{3} = 1000x$$
$$211 = 990x$$
$$x = \frac{211}{990}$$

$\frac{211}{990}$

(Total 3 marks)

4. Prove that $0.4\dot{7}\dot{3}$ can be written as the fraction $\frac{469}{990}$

$$0.4\dot{7}\dot{3} = x$$
$$4.\dot{7}\dot{3} = 10x$$
$$473.\dot{7}\dot{3} = 1000x$$
$$469 = 990x$$
$$x = \frac{469}{990}$$

(Total 2 marks)

5. Prove that the recurring decimal $0.\dot{1}\dot{7} = \frac{17}{99}$

$$0.\dot{1}\dot{7} = x$$
$$17.\dot{1}\dot{7} = 100x$$
$$17 = 99x$$
$$x = \frac{17}{99}$$

(Total 2 marks)

6. (a) Express $0.\dot{2}\dot{7}$ as a fraction in its simplest form.

$$0.\dot{2}\dot{7} = x$$
$$27.\dot{2}\dot{7} = 100x$$
$$27 = 99x$$
$$x = \frac{27}{99}$$
$$= \frac{3}{11}$$

$\frac{3}{11}$

.....

(3)

x is an integer such that $1 \leq x \leq 9$

(b) Prove that $0.\dot{0}\dot{x} = \frac{x}{99}$

$0.\dot{0}\dot{x} = y$

$0x.\dot{0}\dot{x} = 100y$

$x = 99y$

$y = \frac{x}{99}$

(2)
(Total 5 marks)

7. Change the recurring decimal $0.\dot{2}\dot{3}$ to a fraction.

$0.\dot{2}\dot{3} = x$

$23.\dot{2}\dot{3} = 100x$

$23 = 99x$

$x = \frac{23}{99}$

$\frac{23}{99}$

(Total 2 marks)

8. (i) Convert the recurring decimal $0.\dot{3}\dot{6}$ to a fraction.

$0.\dot{3}\dot{6} = x$

$36.\dot{3}\dot{6} = 100x$

$36 = 99x$

$x = \frac{36}{99}$

$= \frac{4}{11}$ $\frac{4}{11}$

(ii) Convert the recurring decimal $2.1\dot{3}\dot{6}$ to a mixed number.
Give your answer in its simplest form. $2 + x$

$0.1\dot{3}\dot{6} = x$

$1.\dot{3}\dot{6} = 10x$

$136.\dot{3}\dot{6} = 1000x$

$135 = 990x$

$x = \frac{135}{990}$

$= \frac{3}{22}$ $2\frac{3}{22}$

(Total 5 marks)

9. Convert the recurring decimal $2.14\dot{5}$ to a fraction.

$2.14\dot{5} = x$

$21.\dot{4}\dot{5} = 10x$

$2145.\dot{4}\dot{5} = 1000x$

$2124 = 990x$

$x = \frac{2124}{990} = \frac{118}{55}$

(Total 3 marks)

10. Express the recurring decimal $0.12\dot{6}$ as a fraction.

$$0.\dot{1}2\dot{6} = x$$
$$1.\dot{2}\dot{6} = 10x$$
$$126.\dot{2}\dot{6} = 1000x$$
$$125 = 990x$$
$$x = \frac{125}{990}$$
$$= \frac{25}{198}$$

$\frac{25}{198}$

(Total 3 marks)

11. Express $0.3\dot{2}\dot{8}$ as a fraction in its simplest form.

$$0.3\dot{2}\dot{8} = x$$
$$3.\dot{2}\dot{8} = 10x$$
$$328.\dot{2}\dot{8} = 1000x$$
$$325 = 990x$$
$$x = \frac{325}{990}$$
$$= \frac{65}{198}$$

$\frac{65}{198}$

(Total 3 marks)

12. The recurring decimal $0.\dot{7}\dot{2}$ can be written as the fraction $\frac{8}{11}$

Write the recurring decimal $0.5\dot{7}\dot{2}$ as a fraction.

$0.\dot{7}\dot{2} = \frac{8}{11}$

$0.0\dot{7}\dot{2} = \frac{8}{110}$

$0.5 + 0.0\dot{7}\dot{2} = \frac{55}{110} + \frac{8}{110}$

$\frac{63}{110}$

(Total 2 marks)

13. Express the recurring decimal $2.0\dot{6}$ as a fraction.
Write your answer in its simplest form.

$2.0\dot{6} = x$

$20.\dot{6} = 10x$

$206.\dot{6} = 100x$

$186 = 90x$

$x = \frac{186}{90}$

$= \frac{93}{45}$

$= \frac{31}{15}$

$\frac{31}{15}$

(Total 3 marks)