SOLUTIONS FOR BNU 1501 EXAMINATION QUESTION PAPER OCTOBER/NOVEMBER 2014

1. $a^3 - 2ba^2 + 10b^2a - 5a^2b + 14b^3 - 7ab^2$

   $a^3 - 2a^2b - 5a^2b - 7ab^2 + 10ab^2 + 14b^3$

   $a^3 - 7a^2b + 3ab^2 + 14b^3$ Option [3]

2. $30xy - (15x^2y^3\ X\ 2y^0)$

   $30xy - 30x^2y^3$ Option [5]

3. $30x^4y^3 - 15x^2y^3\ X\ 2y^3$

   $30x^4y^3 - 30x^2y^6$ Option [5]

4. $2x - 3 = 3 - x$

   $2x + x = 3 + 3$

   $3x = 6$

   $x = 2$ Option [3]

5. $2(2x - 1) = x + 1$

   $4x - 2 = x + 1$

   $4x - x = 1 + 2$

   $3x = 3$

$\frac{3x}{3} = \frac{3}{3}$

$x = 1$ Option [4]

6. $5(x - 3)$ Option [2]

7. $Distance = Speed\ X\ Time$

   $d = \frac{270}{p}\ X\ x$ Option [1]

8. $C = 10 + 10 + \left(\frac{1}{2}\ X\ 2\pi\ X\ 5\right) + 10 + 10 + \left(\frac{1}{2}\ X\ 2\pi\ X\ 5\right)$

   $C = 20 + 15.70796327 + 20 + 15.70796327$

   $C = 71.41592654cm$ $but\ 100cm = 1m$

   $C = \frac{71.41592654}{100}$

   $C = 0.71m$ Option [1]

9. $Total\ area\ of\ two\ triangles = 2\ X \frac{1}{2}\ X\ 16\ X\ 6 = 96cm^2$

   $Total\ area\ of\ two\ half\ circles = 2\ X \frac{1}{2}\ X\ \pi\ X\ 5\ X\ 5 = 78.54cm^2$

   $Area\ of\ a\ rectangle = 16\ X\ 10 = 160\ cm^2$

   $Total\ area = 96 + 78.54 + 160 = 334.54cm^2$ Option [4]

10. $V = l\ X\ b\ X\ h$

$V = 60\ X\ 35\ X\ 10$

$V = 21\ 000cm^3$ $but\ 1cm^3 = 0.001l$

$V = 21\ 000\ X\ 0.001l$

$V = 21l$ Option [4]

11. $Area\ of\ playing\ field = 32m\ X\ 32m = 1\ 024m^2$

$Cost = 1\ 024\ X\ 60 = R61\ 440.00$ Option [3]

12. $S = P(1 + rt)$

$\frac{S}{1+rt} = \frac{P(1+rt)}{1+rt}$

$P = \frac{S}{1+rt}$ Option [2]

13. $c = \frac{x}{a} - b$

$b + c = \frac{x}{a}$

$x = a(b + c)$

$x = ba + ca$ Option [3]

14. $Total\ cost = 500 + (50\ X\ 10)$

$= 1\ 000$

$Selling\ price = 35\ X\ 50$

$= 1\ 750$

$Profit = Selling\ price - Total\ cost$

$= 1\ 750 - 1\ 000 = R750 \quad per\ day$

$Profit\ per\ week = 6\ X\ 750$

$= R4\ 500$ Option [4]

15. $Express\ each\ number\ as\ a\ product\ of\ its\ prime\ factors$

$18 = 2\ X3\ X\ 3$
$36 = 2\ X\ 2\ X\ 3\ X\ 3$
$27 = 3\ X\ 3\ X\ 3$

$a. LCM = 2\ X\ 2\ X\ 3\ X\ 3\ X\ 3 = 108$

$3st = 3\ X\ s\ X\ t$
$4s^2 = 2\ X\ 2\ Xs\ X\ s$
$5t^2 = 5\ X\ t\ X\ t$

$b. LCM = 2\ X\ 2\ X\ 3\ X\ 5\ X\ s\ X\ s\ X\ t\ X\ t = 60t^2s^2$ Option [5]

16. $a.\quad \frac{3}{8}-\frac{4}{7}\ X\frac{9}{14}$

$=\frac{3}{8}-\frac{36}{98}$

$=\frac{3}{8}-\frac{18}{49}$

$=\frac{3}{392}$

$b.\quad \frac{12}{6}\ X\frac{4}{1}\ \div\frac{1}{2}$

$=\frac{12}{6}\ X\frac{4}{1}\ X\frac{2}{1}$

$=\frac{96}{6}$

=16

$c.\quad \frac{3}{10}+\frac{5}{12}$

$=\frac{18+25}{60}$

$=\frac{43}{60}$ Option [5]

17. *Given two points* $(-1,2)$ *and* $(2,1)$

$\frac{y-y1}{x-x1}=\frac{y2-y1}{x2-x1}$

$\frac{y-2}{x-(-1)}=\frac{1-2}{2-(-1)}$

$\frac{y-2}{x+1}=\frac{-1}{3}$

$3(y-2) = -1(x+1)$

$3y - 6 = -x - 1$

$3y = -x - 1 + 6$

$3y = -x + 5$

$y = -\frac{1}{3} + \frac{5}{3}$ Option [5]

18. $600 - 450 = 150$

$Percentage\ loss = \frac{150}{600}\ X\ 100$

$= 25.00\%$ Option [1]

19. $2:5:3$ $sum = 10$

$Melted\ wax = \frac{2}{10}\ X\ 50$

$10.00l$ Option [3]

20. $S = P(1 + rt)$

$S = 22\ 500\ (1 + 0.12\ X\ 5)$

$S = 22\ 500\ (1.6)$

$S = R36\ 000$ Option [3]

21. $S = P(1 + rt)$

$\frac{S}{P} = 1 + rt$

$\frac{S}{P} - 1 = rt$

$r = \frac{\frac{S}{P} - 1}{t}$

$r = \frac{\left[\frac{12\,000}{9\,500} - 1\right]}{\frac{18}{12}}$

$r = \frac{0.263157894}{1.5}$

$r = 0.1754\ X\ 100$

$r = 17.54\%$ Option [1]

22. $S = P\left(1 + \frac{jm}{m}\right)^{tm}$ $where: jm = norminal\ interest\ rate$

$m = number\ of\ compounding\ periods$

$t = number\ of\ years$

$S = Sum\ accumulated$

$P = Principal$

$\left(\frac{S}{P}\right) = \left(1 + \frac{jm}{m}\right)^{tm}$

$ln\left(\frac{S}{P}\right) = tm\ ln\left(1 + \frac{jm}{m}\right)$

$tm = \frac{ln\left(\frac{S}{P}\right)}{ln\left(1 + \frac{jm}{m}\right)}$

$t = \frac{ln\left(\frac{S}{P}\right)}{mln\left(1 + \frac{jm}{m}\right)}$

$$t = \frac{ln\left(\frac{50\,000}{36\,450}\right)}{12ln\left(1+\frac{0.10}{12}\right)}$$

$$t = \frac{0.316081547}{0.099585633}$$

$t = 3.17 \cong 3\ years$ Option [2]

23. $t = \frac{ln\left(\frac{S}{P}\right)}{mln\left(1+\frac{jm}{m}\right)}$

$$t = \frac{ln\left(\frac{7500}{5500}\right)}{12ln\left(1+\frac{0.10}{12}\right)}$$

$$t = \frac{0.310154928}{0.099585633}$$

$t = 3.114 \cong 3\ years$ Option [4]

24. $Outstanding\ amount = 330\,000$

$S = Rs_{n\rceil\ i}$

$\frac{S}{R} = s_{n\rceil\ i}$ but $s_{n\rceil\ i} = \left[\frac{(1+i)^n\ -1}{i}\right]$

$$\frac{S}{R} = \left[\frac{(1+i)^n\ -1}{i}\right]$$

$\frac{iS}{R} = (1+i)^{n} - 1$

$\frac{iS}{R} + 1 = (1+i)^{n}$

$$\ln\left(\frac{iS}{R}+1\right) = n\ \ln(1+i)$$

$$\text{n} = \frac{ln\left(\frac{iS}{R}+1\right)}{\ln(1+i)}$$

$$tm = \frac{ln\left(\frac{iS}{R}+1\right)}{\ln(1+i)}$$

$$t = \frac{ln\left(\frac{iS}{R}+1\right)}{\text{m}\ln(1+i)}$$

$$t = \frac{ln\left(\frac{\left(\frac{0.0775}{12}\right)330\ 000}{5000}+1\right)}{12\ln\left(1+\frac{0.0775}{12}\right)}$$

$$t = \frac{0.355048622}{0.077250811}$$

$$t = 4.596\ \cong 4.60\ years$$ Option [2]

25. $S = R\left[\frac{(1+i)^n-1}{i}\right]$

$$400\ 000 = R\left[\frac{\left(1+\frac{0.085}{52}\right)^{52X12}-1}{\frac{0.085}{52}}\right]$$

$$400\ 000 = R(1083.365771)$$

$$R = \frac{400\ 000}{1083.365771}$$

$$R = R369.21 \cong R369$$ Option [2]