1. For laminar flow through slit, fanning friction factor can be written as

a) $\frac{16}{N''_{Re,gen}}$

b) $\frac{24}{N''_{Re,gen}}$

c) $\frac{12}{N''_{Re,gen}}$

d) $\frac{10}{N''_{Re,gen}}$

ANSWER: b

2. Non-Newtonian fluid is pumped through a slit, where K= 50 Pa.s^n and n=0.5, then find out y''?

a) 16.67 Pa.s^n

b) 38.49 Pa.s^n

c) 33.33 Pa.s^n

d) 23.63 Pa.s^n

ANSWER: c

y'' = K'' 3^{n-1} = K $(\frac{2n+1}{3n})^n$ 3^{n-1}

y''= 50 $\times \left(\frac{2\times0.5+1}{3\times0.5}\right)^{0.5} \times 3^{0.5-1}$

y''= 33.33 Pa.s^n

3. If an object has the volume V_p, Diameter D_p and surface area S_p, then the sphericity of that object can be given as

a) $\frac{6*Vp}{Dp*Sp}$

b) $\frac{6*Dp}{Vp*Sp}$

c) $\frac{6*Sp}{Vp*Dp}$

d) None of the above

ANSWER: a

4. If v' is the velocity based on empty cross section of the bed and ε is the void ratio, then actual velocity through void space v will be given as

a) v = v' ε

b) v = v'/ ε

c) $v = v'(1- \varepsilon)$
d) $v = v'/(1- \varepsilon)$

ANSWER: b

5. Burke-Plummer equation is valid for
a) $N_{Re}<10$
b) $N_{Re}>1000$
c) $10 <N_{Re}<1000$
d) None of the above

ANSWER: b

6. Blake – Kozeny equation is valid for
a) $N_{Re}<10$
b) $N_{Re}>1000$
c) $10 <N_{Re}<1000$
d) None of the above

ANSWER: a

7. If a is the total surface area available per unit volume of bed, then Specific Surface Area of Particle a_v can be given as
a) $a(1-\varepsilon)$
b) $a/(1-\varepsilon)$
c) $a\varepsilon$
d) a/ε

ANSWER: b

$\because a = a_v(1-\varepsilon)$

$\therefore a_v = a/(1-\varepsilon)$

8. The unit of specific surface area of particle is
a) m
b) m^{-1}
c) m^2/m^3
d) Both (b) and (c)

ANSWER: d

Specific Surface Area of Particle = $\frac{\text{Surface area of particle}}{\text{Volume of particle}}$

$= \frac{m^2}{m^3} = m^{-1}$

9. When diameter of particle is less than 1 mm, then it is called as
a) sieve analysis diameter
b) Nominal diameter
c) geometric mean diameter
d) Both (a) and (b)

ANSWER: d

10. Ergun equation is the sum of
a) Hagen-Poiseulle and Burke-Plummer equation
b) Hagen-Poiseulle and Blake – Kozeny equation
c) Blake – Kozeny equation and Burke-Plummer equation
d) None of the above

ANSWER: c