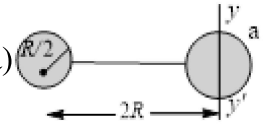
Date :-07/01/2022 **Time :-30 Minutes** **Exam Name :-NEET-1to1Guru-1** **Mark :- 80**

1.	**a**	(a)  Moment of inertia of the system about yy' $I_{yy'}$ = Moment of inertia of sphere P about yy' + Moment of inertia of sphere Q about yy' Moment of inertia of sphere P about yy'' $= \frac{2}{5} M\left(\frac{R}{2}\right)^2 + M(x)^2$ $= \frac{2}{5} M\left(\frac{R}{2}\right)^2 + M(2R)^2$ $= \frac{MR^2}{10} + 4MR^2$ Moment of inertia of sphere Q about yy'' is $\frac{2}{5} M\left(\frac{R}{2}\right)^2$ Now, $I_{yy'} = \frac{MR^2}{10} + 4MR^2 + \frac{2}{5} M\left(\frac{R}{2}\right)^2 = \frac{21}{5} MR^2$
2.	**b**	(b) Here, Moment of inertia, $I = 3 \times 10^2 kg\ m^2$ Torque, $\tau = 6.9 \times 10^2 Nm$ Initial angular speed, $\omega_0 = 4.6$ rad s^{-1} Final angular speed, $\omega = 0$ rad s^{-1} As $\omega = \omega_0 + \alpha t$ $\alpha = \frac{\omega - \omega_0}{t} = \frac{0 - 4.6}{t} = -\frac{4.6}{t}$ rad s^{-2} Negative sign is for deceleration Torque, $\tau = I\alpha$ $6.9 \times 10^2 = 3 \times 10^2 \times \frac{4.6}{t}$ $t = \frac{3 \times 10^2 \times 4.6}{6.9 \times 10^2} = 2s$
3.	**a**	(a) Let R be the radius of earth and ρ its density, then since shape of earth is assumed spherical we have Mass of earth = volume × density $M = \frac{4}{3}\pi R^3 \times \rho$ .... (i) The acceleration due to gravity which arises in the body due to gravitational force of attraction is given by $g = \frac{GM}{R^2}$ .... (ii) Putting the value of M from Eq.(i), we get $g = \frac{G\frac{4}{3}\pi R^3 \rho}{R^2} = G\frac{4}{3}\pi R\rho$ .... (iii) Given, $\rho_p = \rho, R_p = 0.2R_e$ $\therefore\ g_p = G\frac{4}{3}\pi R_p \rho_p = G \times \frac{4}{3}\pi \times 0.2R\rho = 0.2g$
4.	**b**	

		(b) $Y = 2\eta(1+\sigma)$ $3\eta = 2\eta(1+\sigma)$ $\sigma = \frac{3}{2} - 1 = \frac{1}{2}$ Now substituting the value of s in the following expression. $Y = 3K(1-2\sigma)$ $K = \frac{Y}{3(1-2\sigma)} = \infty$
5.	**b**	(b) $\Delta\lambda = 706 - 656 = 50\,\text{nm} = 50 \times 10^{-9}\text{m}, v = ?$ As $\frac{\Delta\lambda}{\lambda} = \frac{v}{c}$ $\therefore\ v = \frac{\Delta\lambda}{\lambda} \times c = \frac{50 \times 10^{-9}}{656 \times 10^{-9}} \times 3 \times 10^{8}$ $= 2.2 \times 10^{7}\text{ms}^{-1}$
6.	**b**	(2) Perfectly semi-permeable membrane allows the passage of solvent particles only
7.	**c**	(c) $CH{\equiv}CH \xrightarrow{2HCl} C\,H_3CHCl_2$
8.	**a**	(a) β_4 for $[ML_4]^{2-}$ can be written as $\beta_4 = \frac{[ML_4]^{2-}}{[M^{2+}][L^-]^4} = 2.5 \times 10^{13}$ The overall formation equilibrium constant can be written as $k = \frac{[ML_4]^{2-}}{[M^{2+}][L^{-1}]^4}$ $k = \beta_4 = 2.5 \times 10^{13}$
9.	**d**	(d) Energy required for 1 Cl_2 molecule $= \frac{242 \times 10^3}{N_A}$ J $E = \frac{hc}{\lambda}$ or $\lambda = \frac{hc}{E} = \frac{6.626 \times 10^{-34} \times 3 \times 10^8 \times 6.02 \times 10^{23}}{242 \times 10^3}$ $= 494 \times 10^{-9}\text{m} = 494\,\text{nm}$
10.	**c**	(c) $100 \xrightarrow{2\,days} 50$ $50 \xrightarrow{4\,days} 25$ $25 \xrightarrow{8\,days} 12.5$ Hence, the order of reaction is second. For second order reaction, $k = \frac{1}{2}\left[\frac{x}{a(a-x)}\right] = \frac{1}{2}\left[\frac{50}{100 \times 50}\right]$ $= \frac{1}{200}$ $t_{1/2} = \frac{1}{k.a}$ $\Rightarrow = \frac{1}{1/200.100}$ $= \frac{200}{100} = 2days$
11.	**c**	(c) Primitive man was originated during Pleistocene epoch.
12.	**b**	(b) Cytokinins increase shelf life of vegetables and cut flowers.
13.	**c**	(3) *Australopithecus* (first ape man) *Australopithecus Africans* appeared about 5 million years ago and is also called African ape man. He was about 1.5 meters high and had human as well as ape characters. *Australopithecus africanus* had also gave rise to man like apes called *Australopithecus robust us* and *Australopithecus boisei* along a separate line end that ends blindly
14.	**d**	(d) Green house effect is the warming up of earth due to accumulation of green house gases. Green house gases mainly include carbon dioxide(CO_2), methane (CH_4),chlorofluorocarbons($CFCs$) , etc.

15.	**a**	(a) The rights and left hepatic duct joins to form the common hepatic duct, which joins the cystic duct arising from gall bladder. The cystic duct and common hepatic duct joins to form common bile duct, which after joining the main pancreatic duct forms, hepatopancreatic ampulla. The ampulla opens into duodenum. This opening is guarded by sphincter of Oddi
16.	**b**	(b) *Allium* , 2 n =16 then endosperm has 24 chromosomes. *Oryza* , 2 n =24 then endosperm has 36 chromosomes. *Nicotiana* , 2 n =48 then endosperm has 72 chromosomes. *Saccharum* 2 n =82-124 (Indian cane) then endosperm has 123-186 chromosomes.
17.	**c**	(c) : Plasmids have been modified to be used as vectors. They can clone DNA fragments of about 10 kbp size while cosmid can carry upto 45 kbp, YAC can carry upto 1000-2500 kbp and BAC can carry around 300 350 Kbp long DNA fragments
18.	**a**	(a) Barley seeds are rich in carbohydrate (starch). The starch is hydrolysed by α -amylase to monosaccharides unit at the time of germination of seeds.
19.	**d**	(d) : Nucleoproteins are compounds present in cells of living organisms that consist of nucleic acids with proteins. Nucleoproteins are synthesized in cytoplasm. These are conjugated proteins. They are of two types -deoxyribonucleoproteins and ribonucleoproteins
20.	**a**	(a) Physiological barriers like body temperature, pH of the body fluids and other body secretion prevent growth of several disease causing microorganisms. Certain kinds of cells, When infected with a virus release interferons (glycoproteins). Interferons (IFNs) make the cells resistant to viral infections.