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Pre-Medical Model Entrance Exam

2074

(Set-II)

Date: 2075/04/12

Hints and Solutions

NAME

Solutions for Pre-Medical Model Entrance Exam set -II (2075-04-12)

Physics

- b) The resultant of \vec{A} , \vec{B} and \vec{C} can be zero only when they lie in the same plane.
- c) $R_{\max} = \frac{u^2}{g} = 1.6 \text{ m}$ $\therefore u = 4 \text{ m/s}$ $\theta = 45^\circ$
 $x = 4 \cos 45^\circ \times t = 4 \times \frac{1}{\sqrt{2}} \times 10 = 20\sqrt{2} \text{ m}$
- a) Least force required to move a weight w on horizontal plane is equal to force of friction
 $= \mu R = \tan \theta mg = \tan \theta w$
- d) $\omega^2 = \omega_0^2 + 2\alpha\theta$
 $\left(\frac{\omega_0}{2}\right)^2 = \omega_0^2 + 2\alpha(40 \times 2\pi) \dots\dots\dots (i)$
and $0 = \omega_0^2 + 2\alpha(2\pi N) \dots\dots\dots (ii)$
On solving we get $N = 44$
 \therefore Additional rotations = $44 - 33 = 11$
- d) $T \propto R^{3/2}$ so $\frac{T^1}{T} = \left(\frac{R+3R}{R}\right)^{3/2} = 8$
 $T^1 = T \times 8 = 90 \times 8 = 720 \text{ minutes}$
- d) When a solid sphere falls in vacuum, no viscous force is acting on the body and the body falls under gravity. Due to which there will be no terminal velocity of body.
- d) As $E \propto T^4$
When $T = \frac{1}{3} \text{ rd}$, $E = \left(\frac{1}{3}\right)^4 = \frac{1}{81} \text{ time}$
- a) $P = \frac{1}{3} \frac{mN}{V} C_{\text{rms}}^2 \propto m C_{\text{rms}}^2$
 $\frac{P^1}{P_0} = \frac{(2m) \left(\frac{C_{\text{rms}}}{2}\right)^2}{m C_{\text{rms}}^2} = \frac{1}{2}$
 $\therefore P^1 = \frac{1}{2} P_0$
- c) Isothermal compression is reversible. The reverse is isothermal expansion. Heat required in this process is gained from the surroundings.
- b) $M = M_0 \times M_e$
 $30 = 5 \times M_e$
 $M_e = 6$
- b) Shift = $d \left(1 - \frac{1}{\mu}\right) = 6 \left(1 - \frac{1}{\frac{3}{2}}\right) = 2 \text{ cm}$
- a) $q_1 = 10 \times 50 = 500 \mu\text{C}$, $C_1 = 10 \mu\text{F}$, $C_2 = ?$
 $q_2 = 0$ $V = \frac{q_1 + q_2}{C_1 + C_2} \Rightarrow C_1 + C_2 = \frac{q_1 + q_2}{V} = \frac{500 + 0}{20}$
 $\Rightarrow 10 + C_2 = 25 \mu\text{F}$
 $C_2 = 15 \mu\text{F}$

Chemistry

13. b) $\text{CH} \equiv \text{CH} + 2\text{HCl} \rightarrow \text{CH}_3\text{CHCl}_2$
14. c) $x + 2 - 2 \times 1 = \therefore x = 0$
15. c) $\overset{+}{\text{R}}\text{CH}_2 < \text{R} - \overset{+}{\text{C}} = \text{CH}_2 < \text{R} - \overset{+}{\text{C}}\text{H} - \text{CH}_3$
16. c)
$$\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_2\text{Cl} - \text{C} - \text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$$
17. b)
18. b) C_2H_2 has two π -bonds
19. d) Charcoal
20. c)
21. a) The energy of $(n - 1)d$ orbital is lower than np orbital.
22. a) $K_p = K_c(RT)^{\Delta n} = -1$
23. d) An orbital can accommodate two electrons with paired spins.
24. a) No. of moles of C = $\frac{75}{12} = 6.25$
No. of moles of H = $\frac{25}{1} = 25$ \therefore ratio of C : H = 1 : 4
25. d) red lead is Pb_3O_4

Botany

26. d) Pollination in gymnosperms is exclusively anemophilous. Few monocots are pollinated by insects.
27. b) Edible part of cauliflower is corymbose inflorescence.
28. a) Potato has modified underground stem for storage and vegetative reproduction called tubers.
29. d) Single seeded fruit called caryopsis is common character of members of family Poaceae (Graminae).
30. b) Mitosis is equational division for chromosomes and reductional division of DNA.
31. c) Sciophytes plant prefers to grow in shade or moist area.
32. d) Viroids are naked virus having ssRNA without capsid or protein coat.
33. c) Post S phase or G2 phase is responsible for synthesis of cytoplasmic DNA.
34. c) The ecological study between community of plant and animals with their habitat is called synecology. Autecology deals with population.

35. d) Members of Malvaceae is characterized by presence of numerous, epipetalous, monadelphous (filament fused anther free) stamens.
36. d) Pteridophytes is vascular plant having embryo without seeds. Algae and fungi have no embryo and bryophytes have no vascular tissues.
37. c) Sexual reproduction in Spirogyra is conjugation or gametangial copulation.

Zoology

38. b) Volant adaptation:
Short tail, strong streamlined body, Pneumatic bone, beak, wings, preen glands, sharp vision, highly developed cerebellum
39. c) Salmon-Anadromous for spawning
Carps - Potamodrous for spawning
Anguila - Catadromous for spawning
40. c) Triassic period - first dinosaur and first mammal appeared.
41. c) Myriapoda, arachnida - arthropoda
Calcare - porifera
42. c) Gizzard - internal thick cuticle, covered by thick circular muscles.
43. c) In kidney, vasa efferentia open into Bidder's canal which is connected to the urinogenital duct through collecting tubules.
44. b) Air bladder present only in bony fish eg. flying fish.
45. b) Trophozoites feeds on haemoglobin.
Hb: Haeme-iron derivates \rightarrow no digestion
Globin - is present -under digestion
Undigested haeme changes in toxic substance called haemozoin.
Haemozoin cause chills and fever.
46. b) There is no respiratory pigment in haemolymph, the blood of cockroach does not function as an oxygen carrier.
47. d) A larval stage occurs in houseflies that lives in dung and is called maggot.
48. a) Water vascular system in Echinodermata.
49. c) *Loa loa*-eye worm, *Echinococcus* - dog tapeworm, *Ancylostoma*-hookworm
50. b) *Ascaris* - complete alimentary canal, *Fasciola* and *Planaria*-incomplete alimentary canal, *Taenia*- absent.

Result will be published on Sunday**Log on to www.name.edu.np****or****www.facebook.com/ournamembbs****Best of Luck**