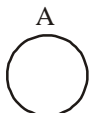
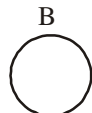
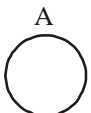
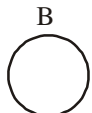
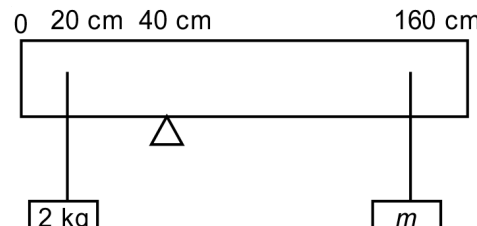


PRABAL TEST PAPER

Time : 1 : 00 Hr.

Question : 50

PHYSICS

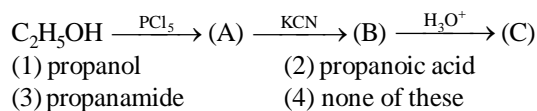
01. A particle moves with a velocity $(5\hat{i} - 3\hat{j} + 6\hat{k})$ ms^{-1} horizontally under the action of constant force $(10\hat{i} + 10\hat{j} + 20\hat{k})$ N. The instantaneous power supplied to the particle is:
 (1) 100 W (2) 140 W
 (3) 200 W (4) Zero
02. A force $F = 20 + 10y$ acts on a particle in y-direction where F is in newton and y in meter. Work done by this force to move the particle from $y = 0$ to $y = 1$ m is:
 (1) 30 J (2) 5 J (3) 25 J (4) 20 J
03. A particle moves from a point $(-2\hat{i} + 5\hat{j})$ to $(4\hat{j} + 3\hat{k})$ when a force of $(4\hat{i} + 3\hat{j})$ N is applied. How much work has been done by the force ?
 (1) 2 J (2) 8 J (3) 11 J (4) 5 J
04. A constant power delivering machine has towed a box, which was initially at rest, along a horizontal straight line. The distance moved by the box in time 't' is proportional to :-
 (1) $t^{2/3}$ (2) $t^{3/2}$ (3) t (4) $t^{1/2}$
05. The two diagrams show the situation before and after a collision between two spheres A and B of equal radii moving along the same straight line on a smooth horizontal surface. The coefficient of restitution e is
- | | | | |
|---|---|---|---|
| before collision | | after collision | |
| A | B | A | B |
|  |  |  |  |
| $\frac{8}{\text{m/s}}$ | $\frac{2}{\text{m/s}}$ | $\frac{2}{\text{m/s}}$ | $\frac{5}{\text{m/s}}$ |
| (1) $\frac{2}{3}$ | (2) $\frac{1}{2}$ | (3) $\frac{1}{3}$ | (4) $\frac{1}{4}$ |
06. Which of the following is true :
 (1) momentum is conserved in all collision but kinetic energy is conserved only in inelastic collision
 (2) neither momentum nor kinetic energy is conserved in inelastic collision
 (3) momentum is conserved in all collisions but not kinetic energy
 (4) both momentum and kinetic energy are conserved in all collisions.
07. A disc is rotating with angular speed ω . If a child sits on it, what is conserved?
 (1) Linear momentum (2) Angular momentum
 (3) Kinetic energy (4) Potential energy
08. For which of the following does the centre of mass lie outside the body ?
 (1) A pencil (2) A shotput
 (3) A dice (4) A bangle
09. A uniform rod of length 200 cm and mass 500 g is balanced on a wedge placed at 40 cm mark. A mass of 2 kg is suspended from the rod at 20 cm and another unknown mass 'm' is suspended from the rod at 160 cm mark as shown in the figure. Find the value of 'm' such that the rod is in equilibrium. ($g = 10 \text{ m/s}^2$)
- 
- | | |
|-----------------------|----------------------|
| (1) $\frac{1}{12}$ kg | (2) $\frac{1}{2}$ kg |
| (3) $\frac{1}{3}$ kg | (4) $\frac{1}{6}$ kg |

10. The moment of the force, $\vec{F} = 4\hat{i} + 5\hat{j} - 6\hat{k}$ at $(2, 0, -3)$, about the point $(2, -2, -2)$, is given by
- (1) $-8\hat{i} - 4\hat{j} - 7\hat{k}$ (2) $-4\hat{i} - \hat{j} - 8\hat{k}$
(3) $-7\hat{i} - 4\hat{j} - 8\hat{k}$ (4) $-7\hat{i} - 8\hat{j} - 4\hat{k}$

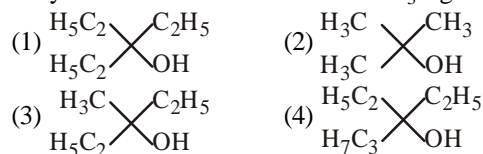
CHEMISTRY

11. A system at equilibrium is described by the equation of fixed temperature T.
 $\text{SO}_2\text{Cl}_2(\text{g}) \rightleftharpoons \text{SO}_2(\text{g}) + \text{Cl}_2(\text{g})$
What effect will an increase in the total pressure caused by a decrease in volume have on the equilibrium?
- (1) Concentration of $\text{SO}_2\text{Cl}_2(\text{g})$ increases
(2) Concentration of $\text{SO}_2(\text{g})$ increases
(3) Concentration of $\text{Cl}_2(\text{g})$ increases
(4) Concentration of all gases increases
12. What change will occur for the following reaction if the hypochlorous acid solution is diluted from 0.1 to 0.01 M?
 $\text{HOCl}(\text{aq.}) + \text{H}_2\text{O}(\text{l}) \rightleftharpoons \text{OCl}^-(\text{aq.}) + \text{H}_3\text{O}^+(\text{aq.})$
- (1) a decrease in the fraction of acid ionized
(2) an increase in the fraction of acid ionized
(3) no change in the fraction of acid ionized
(4) we can not predict
13. The pH values 0.1 M solution of HCOONa (I), HCOOH (II), $\text{CH}_3\text{COONH}_4$ (III), NaOH (IV), HCl (V), will be in the order
- (1) $\text{IV} > \text{III} > \text{I} > \text{II} > \text{V}$ (2) $\text{IV} > \text{I} > \text{III} > \text{II} > \text{V}$
(3) $\text{II} > \text{III} > \text{I} > \text{IV} > \text{V}$ (4) $\text{V} > \text{II} > \text{III} > \text{I} > \text{IV}$
14. Which of the following is most soluble in water?
- (1) $\text{Ba}_3(\text{PO}_4)_2$ ($K_{sp} = 6 \times 10^{-39}$)
(2) ZnS ($K_{sp} = 7 \times 10^{-16}$)
(3) $\text{Fe}(\text{OH})_3$ ($K_{sp} = 6 \times 10^{-38}$)
(4) $\text{Ag}_3(\text{PO}_4)$ ($K_{sp} = 1.8 \times 10^{-18}$)
15. pH of a saturated solution of $\text{Ca}(\text{OH})_2$ is 9. The solubility product (K_{sp}) of $\text{Ca}(\text{OH})_2$ is :-
- (1) 0.5×10^{-10} (2) 0.5×10^{-15}
(3) 0.25×10^{-10} (4) 0.125×10^{-15}
16. When $\text{K}_2\text{Cr}_2\text{O}_7$ is converted to K_2CrO_4 , the change in the oxidation state of chromium is
- (1) 0 (2) 6 (3) 4 (4) 3
17. In which of the following reactions, H_2O_2 is acting as a reducing agent?
- (1) $\text{SO}_2 + \text{H}_2\text{O}_2 \rightarrow \text{H}_2\text{SO}_4$
(2) $2\text{KI} + \text{H}_2\text{O}_2 \rightarrow 2\text{KOH} + \text{I}_2$
(3) $\text{PbS} + 4\text{H}_2\text{O}_2 \rightarrow \text{PbSO}_4 + 4\text{H}_2\text{O}$
(4) $\text{Ag}_2\text{O} + \text{H}_2\text{O}_2 \rightarrow 2\text{Ag} + \text{H}_2\text{O} + \text{O}_2$

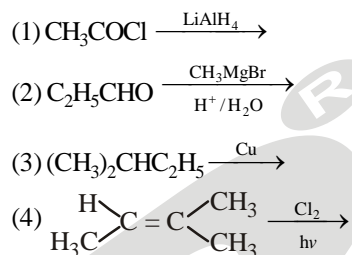
18. The end product of the reaction is:



19. Ethylacetate reacts with excess of CH_3MgBr to form:



20. Which will give chiral molecule?



BOTANY

21. Mendel formulated the law of purity of gametes on the basis of:
- (1) Dihybrid cross (2) Monohybrid cross
(3) Back cross (4) Test cross
22. In monohybrid cross what is the ratio of homozygous dominant and homozygous recessive individuals in F_2 generation?
- (1) 1 : 2 : 1 (2) 2 : 1/1 : 2
(3) 3 : 1/1 : 3 (4) 1 : 1
23. Dihybrid cross proves the law of:
- (1) Segregation of gene
(2) Purity of gametes and genes
(3) Dominance of gene
(4) Independent assortment
24. When a cross between a pure tall plant with green pod and a pure short plant with yellow pod. How many short plants are produced in F_2 generation out of 16?
- (1) 1 (2) 3 (3) 4 (4) 9
25. Two allelic genes are located on:
- (1) The same chromosome
(2) Two homologous chromosomes
(3) Two non-homologous chromosomes
(4) Any two chromosomes
26. Mendel did not select which of the following character in his experiment?
- (1) Plant height (2) Plant colour
(3) Pod shape (4) Pod colour

27. When a tall plant with round seeds (TTRR) is crossed with a dwarf plant with wrinkled seeds (ttrr), the F_1 generation consists of tall plants with rounded seeds. How many types of gametes F_1 plant would produce?
(1) One (2) Three (3) Four (4) Eight
28. The fruit fly *Drosophila melanogaster* was found to be very suitable for experimental verification of chromosomal theory of inheritance by Morgan and his colleagues because:
(1) It reproduces parthenogenetically
(2) A single mating produces two young flies
(3) Smaller female is easily recognisable from larger male
(4) It completes life cycle in about two weeks
29. In 1900 AD, three biologists independently rediscovered Mendel's principles. They were :
(1) Sutton, Morgan and Bridges
(2) Bateson, Punnett and Bridges
(3) Avery, MacLeod and McCarty
(4) Hugo de Vries, Correns and Tschermak
30. In a plant, red fruit (R) is dominant over yellow fruit (r) and tallness (T) is dominant over shortness (t). If a plant with RRTt genotype is crossed with a plant that is rrrt
(1) 25% will be tall with red fruit
(2) 50% will be tall with red fruit
(3) 75% will be tall with red fruit
(4) All of the off springs will be tall with red fruit
31. Number of pink colour flower obtained by crossing $Rr \times Rr$ in a population of 400 in snapdragon species will be
(1) 300 (2) 200 (3) 100 (4) zero
32. Distance between w and m gene present on X-chromosome in *Drosophila* is -
(1) 37.2 centimorgan
(2) 62.8 centimorgan
(3) Proportional to Recombinant
(4) Both 1 and 3
33. Read the following statements and identify the plant and family to which it belongs.
A. Pinnately compound or simple leaf with pulvinate leaf base.
B. Bisexual and zygomorphic flowers.
C. Superior, unilocular ovary with many ovules.
(1) Tobacco; Solanaceae
(2) Asparagus; Liliaceae
(3) Soyabean; Fabaceae
(4) Mustard; Brassicaceae
34. Which of the following statement is incorrect?
(1) In Calotropis, a pair of leaves arise at each node and lie opposite to each other
(2) A bud is present in the axil of petiole in both simple and compound leaves
(3) Leaves are small and long lived in Australian Acacia
(4) Veinlets form a network in the leaves of most dicotyledonous plants.
35. In an inflorescence where flowers are borne laterally in an acropetal succession, the position of the youngest floral bud shall be:
(1) Proximal (2) Distal
(3) Intercalary (4) Anywhere

ZOOLOGY

36. A person smokes many cigarettes daily. It may lead into:
(1) Throat cancer, urinary bladder cancer, hepatitis, gastric ulcer
(2) Throat cancer, lung cancer, increase blood pressure, emphysema, gastric ulcer
(3) Throat cancer, oral cancer, syphilis, dysentery
(4) Bronchitis, oral cancer, CAD, anaemia, increased O_2 level in blood
37. Withdrawal symptoms of drug addiction is:
(1) Showed during epilepsy
(2) Unpleasant symptoms showed due to non-availability of addicted drugs
(3) Unpleasant symptoms showed due to alcoholism
(4) Unpleasant symptoms showed due to narcotic drugs
38. How many statements are correct for typhoid?
(i) It is a bacterial disease.
(ii) *Salmonella typhi* enter the small intestine through food and water.
(iii) Pathogen from small intestine migrates to other organs through blood.
(iv) Sustained high fever (39° to $40^\circ C$), weakness, stomach pain, constipation, headache and loss of appetite are symptoms of this disease.
(v) In severe cases, the lips and finger nails may turn gray to bluish in colour.
(vi) Typhoid fever could be confirmed by Widal test.
(1) Three (2) Four
(3) Five (4) All of these
39. (A) AIDS was reported first time is 1981.
(B) Genetic material of HIV is a ssRNA.
(C) HIV attacks macrophage and helper T-cells.
(D) AIDS is detected by ELISA test.
(1) Only (A) is correct
(2) (A) and (B) are correct
(3) (A), (B) and (C) are correct
(4) All are correct
40. Which statements are correct for common cold?
(i) It caused by Rhino viruses group.
(ii) They infect the nose and upper respiratory passage.
(iii) The common cold is characterised by nasal congestion and discharge, sore throat, tiredness
(iv) Symptoms of common cold usually last for one days.
(v) It transmitted through droplets resulting from cough or sneezes of an infected person.
(vi) It also transmitted through vectors.

(vii) It occurs when a healthy person comes in contact with contaminated objects such as pens, books, cups, doorknobs, computer keyboard or mouse, etc.

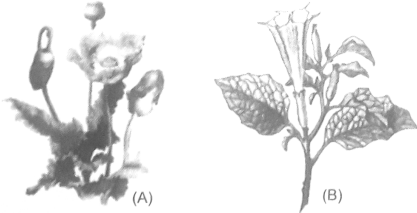
- (1) (i), (ii), (iii), (v) and (vii)
 (2) (i), (iii), (v) and (vii)
 (3) (i), (ii), (iii), (v) and (vi)
 (4) All of the above

41. Match the columns:

	Column A		Column B
A.	Physical barrier	1.	Macrophages, neutrophils
B.	Physiological barrier	2.	Mucus lining of respiratory tracts
C.	Cellular barrier	3.	Saliva in mouth, tears in eyes, acid in stomach
D.	Cytokine barrier	4.	Interferons

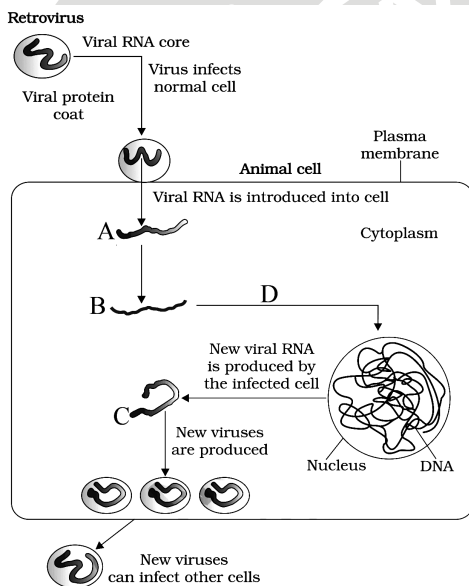
- (1) A-2; B-4; C-3; D-1 (2) A-2; B-3; C-1; D-4
 (3) A-3; B-4; C-1; D-2 (4) A-4; B-3; C-2; D-1

42. Select correct option regarding to structure given below:



- (1) (A)-Datura, (B)-Opium
 (2) (A)-Opium, (B)-Bhang
 (3) (A)-Opium, (B)-Datura
 (4) (A)-Morphine, (B)-Cannabis

43. The figure given below shows mode of action of AIDS virus. Identify steps A, B, C and D labelled in it:



NOTE: Infected cell can survive while viruses are being replicated and released

- (1) A-viral RNA, B-viral DNA, C-viral DNA incorporated into host genome, D-new viral DNA.
 (2) A-viral DNA, B-viral DNA, C-new viral RNA, D-viral RNA introduced into host genome.
 (3) A-viral RNA, B-viral DNA, C-new viral RNA, D-viral DNA incorporated into host genome
 (4) A-viral DNA, B-viral RNA, C-new viral DNA, D-viral RNA incorporated into host genome.

44. Which one of the following is not a property of cancerous cells whereas the remaining three are?

- (1) They compete with normal cells for vital nutrients
 (2) They do not remain confined in the area of formation
 (3) They divide in an uncontrolled manner
 (4) They show contact inhibition

45. Match List-I with List-II:

	List - I		List - II
(A)	Filariasis	(i)	Haemophilus influenzae
(B)	Amoebiasis	(ii)	Trichophyton
(C)	Pneumonia	(iii)	Wuchereria bancrofti
(D)	Ringworm	(iv)	Entamoeba histolytica

Choose the correct answer from the options given below:

- (1) (A) - (ii); (B) - (iii); (C) - (i); (D) - (iv)
 (2) (A) - (iv); (B) - (i); (C) - (iii); (D) - (ii)
 (3) (A) - (iii); (B) - (iv); (C) - (i); (D) - (ii)
 (4) (A) - (i); (B) - (ii); (C) - (iv); (D) - (iii)

46. Greeks like Hippocrates and Indian Ayurveda system considered health as

- (1) Imbalance of certain 'humors'
 (2) Absence of certain 'humors'
 (3) Balance of certain 'humors'
 (4) Presence of certain 'humors'

47. The source of Taq polymerase used in PCR technique is a

- (1) Thermophilic fungus
 (2) Mesophilic fungus
 (3) Thermophilic bacteria
 (4) Halophilic bacteria

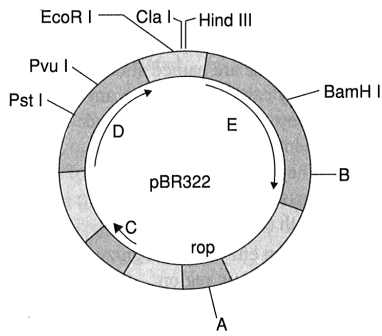
48. Transgenic plants are produced by inserting desired genes in

- (1) pBR322 (2) T₁ plasmids
 (3) Lambda phage (4) None of these

49. The fragmented DNA can be visualized by staining DNA with

- (1) NaCl (2) Ethidium bromide
 (3) Ethylene bromide (4) NaBr

50. 'E' in given figure is



(1) Amp^R gene
(3) Chlor^R gene

(2) tet^R gene
(4) Eco^R gene

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